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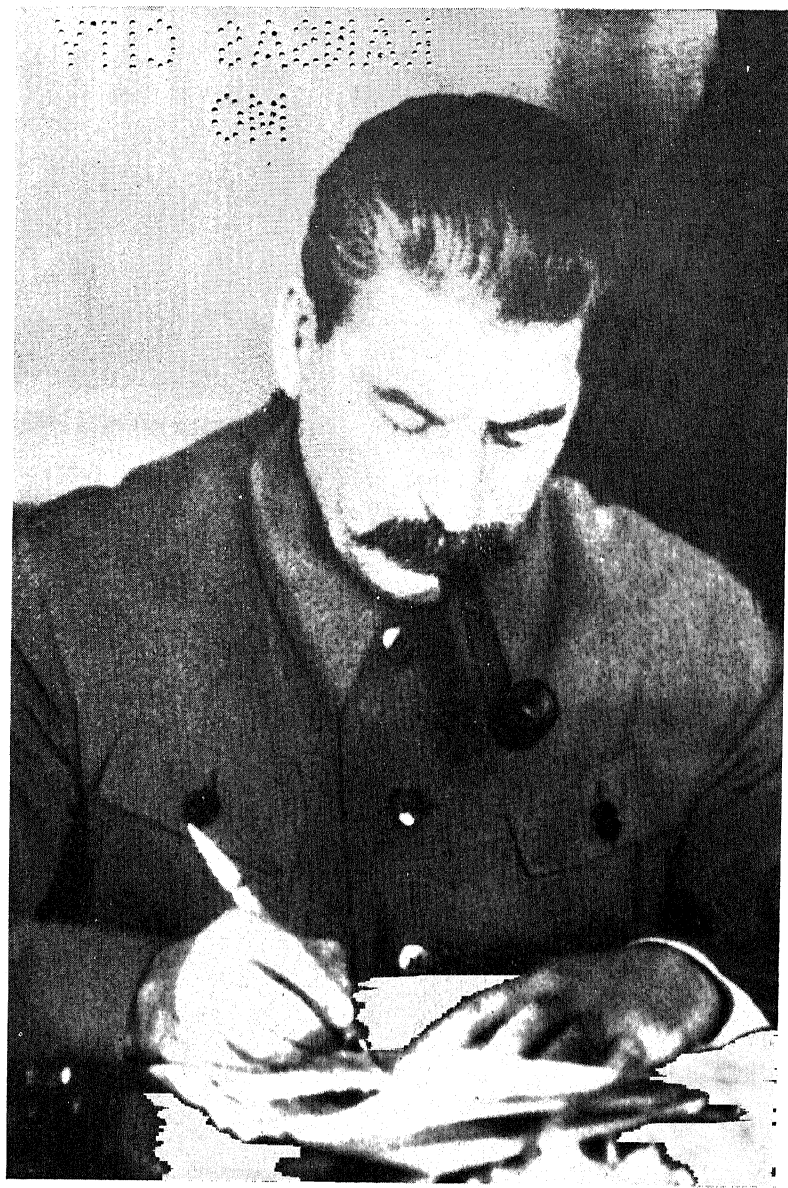
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LAND OF THE SOVIETS



Josef Stalin

LAND OF THE SOVIETS

A HANDBOOK OF THE U.S.S.R.

by

NICHOLAS MIKHAILOV

Author of "Soviet Geography"

Translated from the Russian by

NATHALIE ROTHSTEIN



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LAND OF THE SOVIETS

Natural Features

A SIXTH PART OF THE EARTH'S SURFACE

IN size this country may be compared with whole continents: two Europes, nearly half Asia, greater than South America; forty times as large as France; ninety times as large as Great Britain. It is the largest country in the world with an unbroken territory, and occupies the eastern half of Europe and the northern third of Asia.

It spreads over an area of 8,176,000 square miles,* from India to the North Pole, from the Baltic Sea to Alaska. It covers one-sixth of the inhabited part of the earth's surface, has a population of 170 million, over 175 different peoples, and is a Union of eleven Soviet Socialist Republics.

The sun takes eleven hours to pass over this vast country. When it is nearly evening in Moscow, it is midnight at Lake Baikal, Siberia, and early morning in the far northeastern peninsula of Chukotka. When night falls over the country's western frontier, it is daybreak at the eastern frontier.

On the coast of the Pacific Ocean, near the station platform in Vladivostok, terminus of the railway which crosses the USSR, there stands a milestone bearing the figure 9,323 kilometers, which is 5,793 miles. This equals the distance from New York to Patagonia. What other country knows such distances?

ONE AND A HALF TIMES THE EQUATOR

The USSR comprises the greater part of the rich and habitable lands in the Old World, just as the United States of America comprises the greater part of the rich and habitable lands in the New

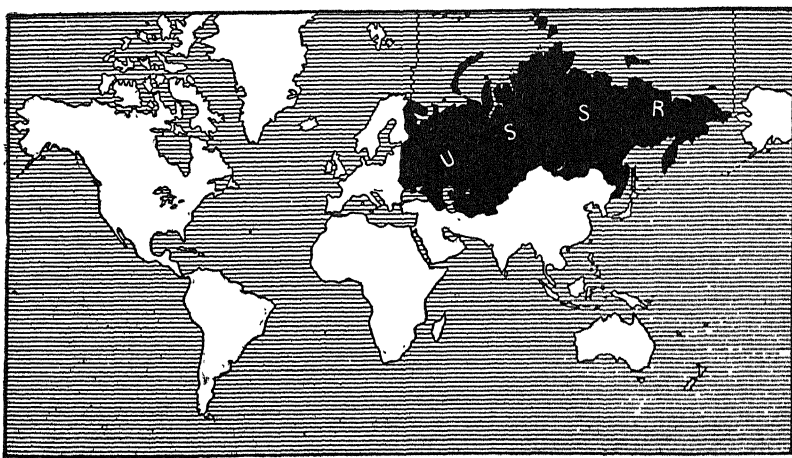
*In the original Russian text, all measurements are given in the metric system.

LAND OF THE SOVIETS

World. The USSR stretches in a latitudinal direction across the northern part of the western hemisphere. But the position of the USSR and the U.S.A. with regard to its neighboring states differs.

The United States borders on only two states, while the USSR borders on more than ten states in Europe and Asia. The frontier lines of the USSR total approximately 37,500 miles, which is one and a half times the length of the equator.

The frontier between the USSR and Finland begins on the coast of the Sea of Barents, not far from North Cape, the most



MAP I—USSR ON THE WORLD MAP

northerly coastal point of Europe. It passes southward through a hilly lake district overgrown with coniferous woods.

Not far from Leningrad the line crosses the Gulf of Finland in the Baltic Sea and then once again passes over dry land, between the USSR and Esthonia, Latvia, and Poland in succession, until forests and swamps are gradually replaced by open densely populated country. From southern Poland, the Soviet Union borders Rumania, and their common frontier extends to the Black Sea coast.

Recommencing at the southeastern corner of the Black Sea, the overland frontier passes over the lofty mountains and through the deep valleys of the Transcaucasus, separating the USSR from

Turkey and Iran. Here, then, the frontier line crosses the Caspian Sea and enters Central Asia; passes over barren mountains, over the hot sandy desert, and along the river Amu-Darya, which at its upper part is called the Pianj.

The Pianj flows through a deep ravine amidst the high Pamirs, the lofty and snow-clad Hindukush range, which belongs to Afghanistan and separates the USSR from India. At its narrowest part the dividing strip is about 9 miles wide.

From here, the line which separates the USSR from Sin-Kiang, the western province of China, passes over the mountains in a northeasterly direction towards Siberia. In Siberia the frontier passes over the wooded Altai and Sayan mountains, separating the USSR from the Tuvin and Mongolian People's Republics.

Considerably to the east of Lake Baikal the frontier between the USSR and Manchuria begins. Here the land is open and hilly and the winters are cold.

Soon the frontier line follows the river Amur, which separates the Soviet Far East and Manchuria for a great distance. The river flows mostly between steep banks, with here and there a section of flat country.

It is a wide river, dividing into channels and forming islands which are overgrown with low, dense leafy forests.

Just before Khabarovsk, the frontier takes the direction of the river Ussuri, a tributary of the Amur, and turns to the south, crossing Lake Khanka and passing over hills, now bare, now overgrown with oak woods.

To the southwest of Vladivostok the Soviet Union for a short distance borders on Korea, the frontier finally emerging at the Pacific Ocean to the south of the Gulf of Possiet. It was in this region, where the frontiers of the USSR, Manchuria, and Korea intersect, that in July and August, 1938, the Japanese army made an armed attempt, near Lake Hassan, to seize part of the territory of the Soviet Union. The Red Army immediately replied with a smashing blow inflicted with the aid of airplanes and tanks. The Japanese were put to rout and ejected from Soviet territory.

The frontier crosses Sakhalin, an island whose northern part belongs to the USSR, and southern part to Japan.

All the remaining portion of the Soviet frontier is on the sea. In the east it follows the Pacific Ocean; in the north, the Arctic Ocean. Here the frontier is continued in imaginary lines passing through the extreme easterly and westerly points of northern Soviet territory and, forming the Soviet Arctic Region, joining at the North Pole. On May 21, 1937 four heavy aeroplanes landed near the North Pole, bringing with them a Soviet scientific expedition which carried out extensive research work during nine months following, while drifting on an ice floe in the Polar Basin.

To the northeast of Siberia the USSR and Alaska are divided by the Bering Straits which are about fifty-five miles wide. When the Straits freeze over in winter, the dominions of the USSR and the U.S.A. are joined.

DRY LAND AND SEA

A land of vast expanses—this is one's first impression when one looks at the map of the Soviet Union.

Because of the low standard of technical development in the past, these huge distances were a hindrance to the economic development of Russia. A hundred years ago Tsar Nicholas I confessed that "Russia suffers from its distances." Now, in the USSR, things are different. These immense expanses, conquered by a mighty system of modern transportation, provide the country with inestimable advantages. Having a great territory, on which all the work is done by advanced technical methods and as part of a definite national plan, makes it possible to utilize to the full the advantages of geographical division of labor between the innumerable regions and thus strengthen the economic independence of the country.

On the map of tsarist Russia great tracts of land in the outlying districts were shown as "white spaces," signifying that many regions were unknown and unexplored. In the USSR hundreds of thousands of square miles of new land—a territory as great as the largest states in Europe—have been visited for the first time, explored, and marked on the map. Expanses of land which had not existed for mankind (in the Arctic, in the Pamirs, in northeastern Siberia), have been opened to the advances of science and industry.

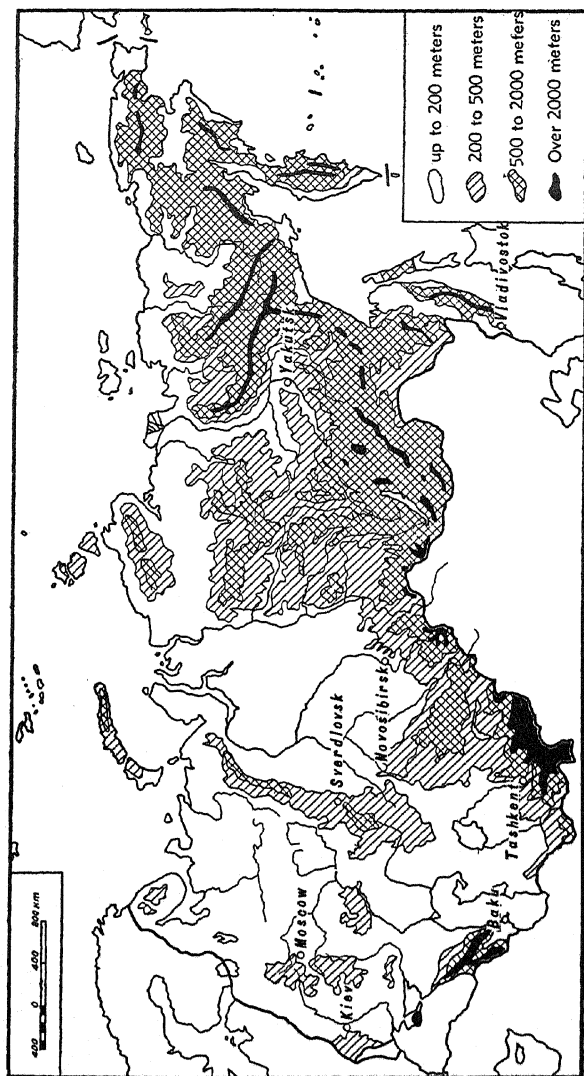
The USSR is a land of infinite natural diversity, providing vivid contrasts and examples of every type of land from endless flat plains to mighty mountain ranges with peaks piercing the clouds. The plains, noted for their fertility, extend in vast level stretches to the horizon and facilitate agriculture as well as transportation over an enormous area. The mountain ranges, now extending in regular chains, now forming intricate highland enclaves, lie mainly in the outlying eastern and southern regions of the country which, owing to historical conditions of tsarist Russia, were less developed than the central parts. Today the Soviet Union is industrializing these untouched regions, and their mineral wealth is lending unprecedented speed to the process.

In general structure of the land the USSR somewhat resembles North America, except that the relation of plains and mountains is reversed in the USSR, the western half of the country being generally flat, while the eastern part is mountainous, in the main. The chief features of the general land structure are shown on map 2 (page 8).

The western plains are crossed in the center by the meridian Ural range (its highest peak being 6,151 feet above sea level), a comparatively low and much eroded chain which bears a great resemblance both in age and contour to the Appalachian Mountains. This divides the West Siberian lowlands from the East European plain which is hilly where it encompasses the Central Russian hills (which reach a height of 1,056 feet), the Volga hills (reaching 1,079 feet) and the Donetz ridge (reaching 1,210 feet).

In the south the plains are succeeded by high mountains which extend from west to east along the southern frontier: the Crimean Mountains (reaching a height of 5,062 feet), the Caucasus (reaching 18,468 feet), the Pamirs (reaching 24,590 feet), Tien-Shan (reaching 22,940 feet), and the Altai Mountains (reaching 14,895 feet).

The eastern half of the USSR, to the east of the Yenissei River, is almost wholly highland country. To the north of Lake Baikal lies the great Central Siberian plateau (average height from 984 to 1,640 feet), hedged in from south to east by a chain of mountain ridges: the Sayan Mountains (reaching 11,450 feet), the Yablonov



MAP 2—RELIEF MAP OF THE USSR

Mountains (reaching 5,282 feet), the Verkhoyansk Mountains (reaching 8,202 feet) and others.

The largest glaciers in the middle latitudes of the world are to be found in the USSR: the Fedchenko glacier in the Pamirs, and Youzhni Inilchek in Tien-Shan, each fifty miles long. They are majestic rivers of ice flowing slowly through the mountain corridors.

Towering above the Pamirs are the mightiest summits in the Soviet Union: Peak Stalin (24,590 feet above sea level), and Peak Lenin (23,386 feet). And not far from them, comparatively speaking, on the east coast of the Caspian Sea, lies the deepest cavity in the country, Karagieh, where the earth's surface is 426 feet below sea level.

The highest active volcanoes of the Old World are in Kamchatka, the loftiest being Mount Kliuchev, a cone-shaped mountain 15,912 feet above sea level.

The Soviet Union has an extensive seacoast verging on three oceans: the Pacific on the east, where the Bering, Okhotsk and Japan Seas wash its shores; the Arctic on the north through its arms the Barents, White, Kara, Laptev, East Siberian and Chukotsk Seas; and on the west the Atlantic whose waters are brought within the borders of the country by the Gulf of Finland, a part of the Baltic Sea. To the southwest lie the Black Sea and the Sea of Azov, and through these bodies of water as well as the Baltic the country is connected with the Atlantic Ocean.

Except for a few gulfs, the southern Black Sea does not freeze in winter. But in the leaden seas of the north, blocks of ice can be seen drifting on the water even in summer. However, there are certain parts of the northern seas which never freeze; for instance in the extreme northwest off the coast of the Kola Peninsula, where the port of Murmansk is situated, and in the extreme northeast off the coast of the peninsula of Kamchatka.

In the past the coast lines bordering the three oceans were unconnected. No through voyages were made in the unexplored Arctic Ocean, while the seas which cut into the western part were not connected by inland waterways. Today an unbroken waterway is in the course of construction along the eastern, northern, and western frontiers. The North East Passage in the Arctic Ocean, from

the Pacific Ocean to the White Sea, has become a reality. In 1935 the White Sea was connected with the Gulf of Finland, an arm of the Baltic Sea, by means of the Stalin White Sea-Baltic Canal. Hydro-technical work is being planned to connect the Gulf of Finland with the Black Sea through the River Volga. Thus all the twelve seas of the USSR will ultimately be connected by an uninterrupted flow of water.

The Soviet Union has many lakes and their nature and economic value differ. There is a remarkable abundance of lakes in the northwest due to the peculiar geography of the region. In the vicinity of Leningrad, there are tens of thousands of them, large and small, which sparkle like steel mirrors in the forests. These lakes are at different levels and are connected by rivers which abound in rapids, and consequently in "white coal"—water power.

Lakes having no outlet and containing valuable salts which provide the raw material for a chemical industry extend in the southern steppes from the Black Sea to the Altai Mountains. For the most part these lakes are the remains of still larger dried-up bodies of water. They are bluish-green lakes, overgrown with thick reeds at their shores, and surrounded by dry yellow-brown plains. Among this group is found the largest lake in the world, so large (162,980 square miles) that it is called a sea—the Caspian Sea. It lies eighty-five feet below sea level and teems with fish.

In the mountainous regions of the USSR there are mountain lakes where the outflow of rivers is stopped by rocky ridges or where there has been a displacement of strata. They are deep, transparent, and blue. The largest of them—Lake Baikal in Eastern Siberia (13,193 sq. mi.) is one of the deepest lakes in the world (5,712 feet). Its water is cold, crystal-clear, and fresh. Lake Baikal lies amidst lofty wooded mountains; the railway which skirts the lake at its south end, passes through fifty tunnels. Within the mountain lakes are concentrated vast resources of water power.

The country possesses a ramified network of rivers. In length and abundance of water many of the rivers of the Soviet Union are second only to the mightiest rivers in the world. In Siberia, flowing into the Arctic Ocean, there are the Ob, 3,235 miles long (with its tributary the Irtysh); the Yenissei, 2,489 miles long; and the Lena,

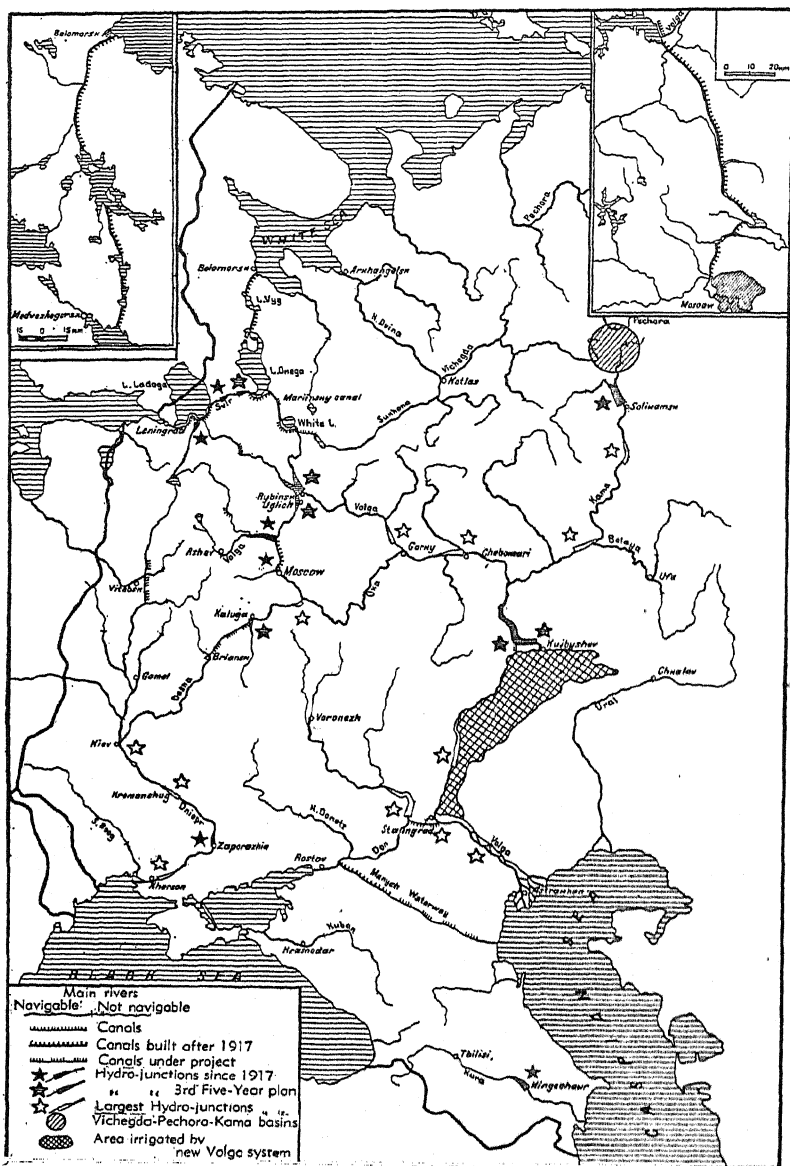
3,116 miles long. Flowing into the Pacific Ocean is the Amur which is about 2,782 miles long, including its tributary the Argun.

The waterways of the country, in view of the abundance of their waters and the great length of the rivers, are well suited for the development of inland water transport, although navigation ceases for a short time during the winter. The sources of the rivers in the European part of the country lie close together and are easily connected by means of canals. At the present time, old canals are being thoroughly reconstructed and new ones built. [See Map 3, page 12.] The Stalin White Sea-Baltic Canal and the Moscow-Volga Canal have already been constructed: the Manich Canal between the Sea of Azov and the Caspian, is in course of construction. The Maria system, connecting the Volga with the Gulf of Finland, is undergoing reconstruction. The Volga-Don Canal is projected. When all this work is completed, Moscow, capital of the USSR, will become a port of five seas: the White, the Baltic, the Caspian, the Black and the Sea of Azov. Already it is connected with the first three seas, and the reconstruction of the waterways is being carried out parallel with the construction of the large hydro-stations.

Most important of all the rivers as a means of transport is the Volga, mightiest of Russian rivers and the longest river in Europe (2,295 miles). Thousands of small rivers and lakes lie in the Volga basin. Every second the Volga pours 2,113,500 gallons of water into the Caspian Sea. Half the river freight of the country is carried by this river, which in its significance to the USSR may be compared with the U.S.A.'s Mississippi.

Soviet rivers are quite varied in type. Many of them like the Volga, flow slowly across the plains; while others, such as the Katun in the Altai, rush through the mountains and seethe with rapids. High water occurs with most of the rivers in spring, when the snow thaws. But the rivers of Central Asia overflow in summer, when the glaciers melt in the mountains; and, also in the summer, the monsoon rains cause the overflow of the rivers of the Far East, where there is but little snow.

Contrasts in nature are dramatic, for the vast expanses of the country include the most varied climatic conditions. In the north-



MAP 3—RECONSTRUCTION OF WATERWAYS

east of Siberia the temperature on occasion falls to -94° F.* In the Central Asiatic desert of Kara-Kum the heat attains a temperature of 158° F. in the sun. The Lower Lena is frozen over for eight months of the year with ice more than $6\frac{1}{2}$ feet thick, while the Rion, in sunny Georgia, never freezes at all.

Within the space of a hundred years the larches on the shores of the Sea of Okhotsk barely attain the thickness of a child's hand, but young bamboos on the Black Sea Coast add one and a half feet to their stature in twenty-four hours. Roses are in bloom in the Transcaucasus when it is mid-winter in Moscow. Spring sowing begins in Turkmenia when Petropavlovsk on Kamchatka is buried in snow to its house-tops.

The territory of the USSR is spanned from north to south by every climatic zone, except the tropic. The frigid zone (the coast of the Arctic Ocean) contains 16% of the country; the temperate zone, 80% and the sub-tropical zone, covering part of the Transcaucasian sea coast and the southern border of Central Asia, 4 per cent. Thus the Soviet Union lies mainly within the belt of temperate climate, yet in comparison with Western Europe and the east coast of the U.S.A., which lie somewhat further south and nearer to the Atlantic Ocean, it is characterized by a greater severity of climate, a comparatively long snowy winter, and a smaller quantity of atmospheric precipitations. In Moscow the summer is warm, sometimes very hot, but in winter the snow does not thaw for over a hundred days.

The USSR is a land of continental climate, with characteristic extremes of summer and winter temperature. This is more marked towards the east where the land is farther away from the tempering influences of the Atlantic Ocean. Severest of all is the climate of Siberia, where in the north, in the Verkhoyansk-Oimekon district, lies the pole of winter frigidity. The annual variation of the temperature is greater here than anywhere else in the world, reaching 103 degrees: from 33° C. in summer to -70° C. in winter (91.4° F. to -94° F.).

Of great influence on the climate of the USSR are the Arctic regions which are faced by the widespread northern regions of the

* In the original Russian text all temperatures are given in the Centigrade scale.

country. Owing to the absence of mountain ranges across the parallels of latitude, masses of arctic air penetrate from time to time fairly far south, bringing frost with them in winter and drought in summer. The study of climatic conditions in the Arctic regions is therefore of peculiar importance to the USSR.

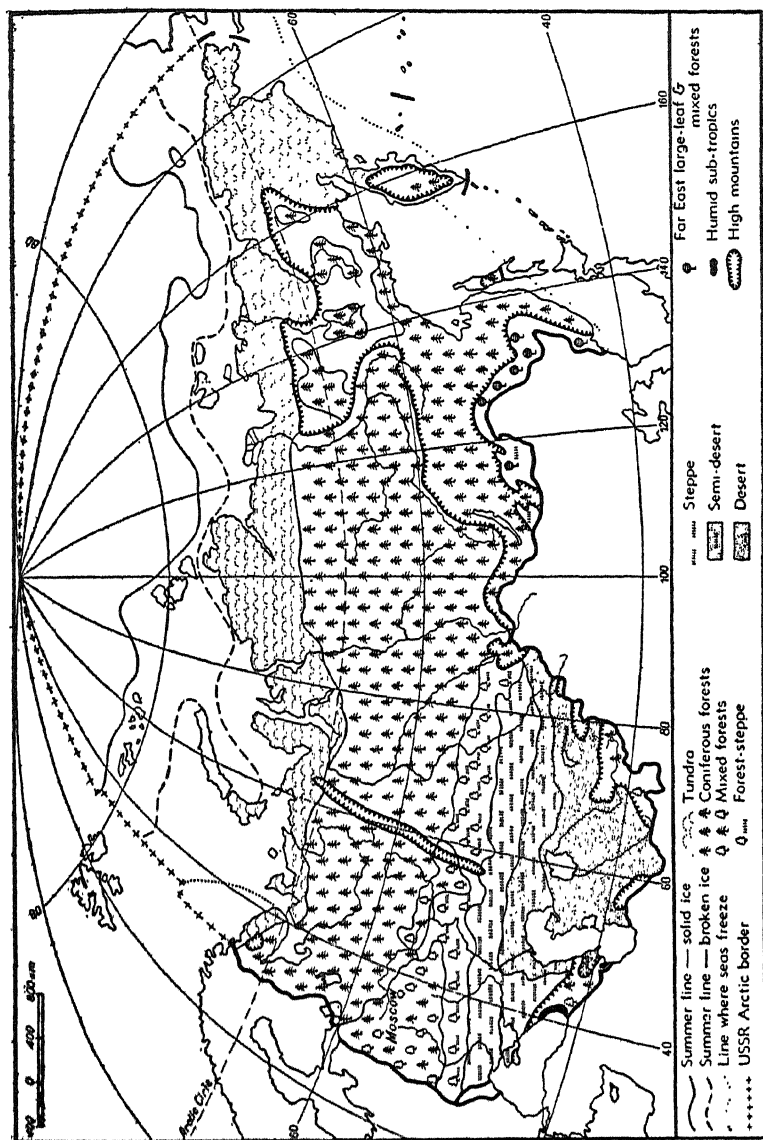
In the west of the European part of the USSR, in the triangle formed by Lake Onega, the river Kama, and the middle part of the Dnieper (Moscow lies approximately in the center of this region), the atmospheric precipitations amount to 20 to 23.5 inches a year. Farther east and especially towards the northeast and southeast, the amount of precipitation decreases—in the central regions of Siberia to 12 to 20 inches, in north Siberia to 4 inches, in the Left Volga region to 8 to 15.6 inches, and in the Central Asiatic deserts to 3.1 inches. The lack of precipitations in the north is compensated by slight evaporation. The two regions with the most humid climate in the USSR are the West Transcaucasus (up to 100 inches) and the Pacific coast (up to 40 inches).

In some regions of the USSR where there is a superabundance of moisture, as in Byelorussia, drainage is in progress. In dry sections, such as the Left Volga region, systematic measures against drought are carried on. On the whole, the climate of the USSR is healthy, temperate and favorable to agriculture.

SEVEN ZONES

There is great variety in the topography of the Soviet Union with its boundless steppes and great dense forests; a range of soils from tundra swamps to red earth; perennial ice on the islands of the Arctic Ocean, and three harvests a year in Colchis on the Black Sea coast; flora from the dwarf birch to the palm, the lichen to the lotus, and fauna from the polar owl to the flamingo, the polar bear to the tiger.

The USSR may be divided into a number of zones in accordance with the character of its vegetation and soils. They lie along the parallels of latitude and succeed one another from north to south as climatic conditions change: the zones of tundra, forest, forest steppe, semi-desert, desert, and of sub-tropics. (See Map 4)



MAP 4—VEGETATIONAL ZONES

In the north, along the coast of the Arctic Ocean, beyond the polar circle, lies the tundra belt, which includes 15% of the whole territory of the USSR.

The winter in the tundra is long and severe with the frosts lasting eight months. The summer is cold, though sometimes there are very warm days when the temperature rises to 86° F. in the shade. The sky is overcast, and mists are frequent. Only a thin outer layer of the earth's crust—from 15 to 60 inches at most—thaws during the short summer.

There are scarcely any trees. Lichens (among them Iceland lichen, the chief food of the reindeer), mosses, and berries grow on this peat-bog, and many large and brightly colored flowers.

The tundra is inhabited by reindeer, polar foxes, ermine, and the tundra partridge, while the polar bear is found on the sea-coast. The birds hold noisy meetings on the rocky shore, and there are plenty of mosquitoes in the summer.

Scientific investigation within the last few years has shown that, under certain conditions, vegetable raising and herb cultivation are feasible in the tundra zone. In the south the tundra gradually merges into the forest zone.

Forests throughout the Soviet Union extend in a wide belt which occupies more than half of the whole territory of the country, though the forests alternate more or less frequently with plowlands. In the most densely populated and industrial regions of the forest zone—mainly in the west of the country—the forests are somewhat thinner, but even here the horizon ends in forest-land.

The southern border of the forest zone passes approximately through the towns of Kiev, Ryazan, Kazan, Tiumen, and Tomsk, while to the east of Tomsk the forests cover the whole country down to the southern frontier of the USSR. The capital of the Soviet Union, Moscow, lies to the south of the forest belt. The north and greater part of the forest belt is covered by coniferous forests (the taiga), and the south and smaller part consists of mixed forests.

The principal trees growing in the coniferous forests of the

European part of the country are firs and pines. There are, in addition, a very insignificant number of foliage trees: birches, poplars, and alders. The Ural range, which separates the European part of the country from the Asiatic, is almost completely covered with taiga. Here, besides the fir and the pine, there are Siberian species: the larch, the cedar, and the spruce. Immense swampy forests of spruce, fir, and cedar cover Western Siberia. In Eastern Siberia the taiga consists mainly of larches and pines, and in the Far East of firs, larches, and cedars.

The mixed forests extend through the whole of the European part of the USSR, their north border passing from northwest to southeast, from Leningrad to the South Urals. In these forests the conifers are mixed with broad-leaved trees—limes, oaks, elms, and maples. Hornbeams are to be found in the southwest.

Highly individual in character the forests of the southern region of the Soviet Far East contain Siberian species mixed with Manchurian and Korean species. In the fir and cedar forests there are thickets of valuable broad-leaved trees: white-barked elms, cork-trees, Manchurian walnuts, and Amur limes. The thick and varied growths on the outskirts of the forest consist of White Amur lilac and Amur acacia, all of them twined about with wild vines. This is the jungle-like "Ussurian taiga."

The soil of the forest zone is of the type known as podzol.

The animals characteristic of the taiga, or rather of its uninhabited regions, include the brown bear, the wolf, the fox, the hare, the squirrel, the elk, and the sable; the birds include the capercaillie, the heathcock, the hazel-grouse, the ptarmigan, the woodpecker, the owl, and the duck. Tigers, Manchurian deer, and boars are also met with in the Far East.

Towards the south the forests become thinner and thinner. The tract between the forest and the steppe is occupied by the forest steppe belt. In the European part of the USSR, the forest steppe region is dotted by islands of oak forests mainly, while in the Asiatic part of the country birch woods are scattered here and there in the forest steppe, otherwise found only in Western Siberia.

The steppe region extends from west to east in an unbroken belt from the western frontiers of the Ukraine to the Altai mountains.

In the south the steppe in the European part of the USSR stretches to the Black Sea, while in the Asiatic part it terminates to the north of the latitude of the Sea of Aral. The steppe zone includes nearly 12 per cent of the territory of the Union.

Black earth soils, remarkable for their great fertility, are found in both the steppe and the forest steppe zones. Towards the south of the steppe zone the black earth gradually passes into a region of lighter brown soils.

The wild grassy surface of the steppe is almost completely ploughed and sown with various crops. There are scarcely any trees except those found growing along the river banks.

The animals in the steppe consist chiefly of rodents—marmots, jerboas, and field mice—and such birds as quails, grey partridges, eagles, hawks, and herons.

From west to east—approximately from the lower Volga to the Lake of Balkhash—and from north to south, approximately from the latitude of the north coast of the Sea of Aral to the foot-hills of Central Asia—stretches the zone of semi-deserts and deserts. They include nearly 18 per cent of the territory of the USSR.

The semi-deserts, which lie to the north of this region, mark the passage from the steppes, with their black earth and brown soils, to the deserts. Increasing dryness of climate here results in a sparser vegetation and plants of lower stature. The soil is rich in salts. The sparse and coarse grass does not cover the dry land, but grows in patches and tufts. Nevertheless, unlike the desert regions, the area with vegetation is greater than the barren stretches. Of the herbs wormwood is most common.

The deserts of the USSR are either of sand or clay, the former occurring more frequently.

In the sand deserts, the sand is either exposed, blown and shifted about in strands by strong winds, or, more frequently, is covered with dry sparse herbage. The saxaul, the tree of the desert, whose branches are covered with leaves in the form of scales, takes root, here and there, in the fixed sand. The largest sandy deserts in the USSR are in Central Asia: Kara-Kum to the west of the river Amu-Darya, and Kizil-Kum to the east of the river.

The animal world of the sands abounds in reptiles. The largest

of the lizards, (the monitor), attains a length of from $3\frac{1}{3}$ to about 5 feet and there is an abundance of snakes and tortoises.

Of the clay deserts the most important are Ust-Urt to the east of the Caspian Sea, and Bet-pak-dala to the west of Lake Balkhash.

In the desert pasture the astrakhan sheep graze and sheep-rearing is highly developed in this region. The grey soils of the deserts, rich in carbonate of lime, become very fertile when they are artificially irrigated. Irrigated oases lie along the rivers which flow down the mountains of Central Asia.

Subtropical tracts lie in the extreme south of the USSR.

Humid subtropics lie on the Black Sea coast and part of the Caspian coast of Transcaucasia. Here the summer is hot and wet and the winter is warmer than in any other part of the Soviet Union. The average temperature of the coldest month is several degrees above freezing-point. Evergreens grow in the dense broad-leaved forests, and from top to bottom the trees are covered with lianas. The fertile red soils yield several harvests a year. On a neglected field, a forest 20 feet high springs up after one or two years, and it is only by dry corn stalks in the forest thicket that one can detect that recently there was a field here. The abundance of warmth and moisture makes it possible to grow the tea plant, citrus fruits (tangerines, oranges, and lemons), bamboo, eucalyptus, tung, rami and other sub-tropical crops.

In the valleys of south Tajikistan and Turkmenia (in Central Asia), which are protected by mountains from the north wind, it is hot and dry. There is scarcely any rainfall in the summer, and scarcely any frost in the winter. These are the "dry" subtropics. Among the crops cultivated are figs, almonds, rubber-plants, olives, and citrus fruits, and a very successful beginning has been made with sugar-cane. For the most part the fields are artificially irrigated.

The subtropical zone in the USSR is comparatively small, but large enough, if rationally used, to provide the country with sub-tropical raw materials.

Mountainous regions are scattered throughout the country, mainly in the south and east. Here the distribution of vegetation is sub-ordinated to a vertical zonal system. The lower slopes of the

mountains are covered by forests, while above them lie Alpine meadows which serve as valuable pastures. The lofty summits are covered with eternal snow.

Such, in broad outlines, are the landscapes of the Soviet Union, which alternate, impinge on each other, and merge. The extraordinary diversity of natural conditions makes it possible to cultivate the most varied types of plants in the Soviet Union. Regions which differ from each other in natural conditions are complements of each other in resources. The systematic division of labor among them, organized on broad lines, is the basis of the successful development of the country as a whole.

NATURAL RESOURCES

The mineral and vegetable resources of the USSR are immense, varied, and universal—the country possesses everything indispensable to ensure powerful and unlimited development.

The power resources accumulated in the bowels of the earth are colossal.

(See Map 5, page 23.)

The deposits of coal in the Soviet Union amount to 1,654 thousand million tons,* which is 21% of the known world deposits and in quantity exceeds a thousandfold the amount of coal mined annually throughout the world. Siberia, the Ukraine, Kazakhstan, and the North Urals, are particularly rich in coal, but there are coal deposits in nearly every important region in the USSR. Its known geological deposits of coal are second only to the United States. Among its coal reserves are such giants as the Kuznetsk field in Western Siberia, with deposits of 450,000 million tons which is two and a half times as much coal as in all the coal fields of Great Britain taken together. In some places the depth of the strata attains the dimensions of a six-storied building. Remarkable anthracites, deposited in quantities of world importance, are concentrated in the eastern part of the USSR.

In the bowels of the earth are also vast deposits of petroleum. The so-called “proved deposits” amount to 3,877 million cubic tons,

* Tons refer to Metric tons = 2,204.6 lbs.

which is 55% of the world oil deposits. The geological oil deposits in the USSR are figured at 6,376 million tons. The most important oil region of the country is the Caucasus; but within recent years large quantities of petroleum have been discovered on the river Emba (the north coast of the Caspian), in the Urals, on the Volga, in Central Asia, and on Sakhalin. For its deposits of oil the USSR takes first place in the world. Among the oil regions of the Soviet Union are such exceptionally rich fields as that of Baku (on the Apsheron peninsula in the Caspian Sea, Transcaucasus), where powerful oil-springs still gush out, though exploitation of petroleum has been proceeding here for over sixty years.

The USSR possesses more than half of the world deposits of peat, which is being used today on a large scale in the northern regions of the country as a profitable form of fuel.

There are immense geological deposits of metal. The deposits of iron ores amount to 10,600 million tons, while including ferriferous quartzites, they amount to 267,000 million tons. The principal regions of iron ores are the Ukraine, the Urals, Eastern Siberia, and the Crimea. Within the borders of the USSR lies a unique accumulation of iron in the earth's crust—the magnetic anomaly of Kursk, to the south of Moscow. Long before the Revolution it was noticed that near Kursk the magnetic needle dipped, attracted to the earth as by a magnet. Nevertheless, it was not until after the Revolution that, according to plan, extensive prospecting for iron ore began on the personal initiative of Lenin. In 1923 iron ore was discovered here in quite exceptional quantities, the total resources of the deposits amounting to approximately 200,000 million tons of iron ores and quartzites.

The Soviet Union possesses 19.4 million tons of copper (this figure relates to the pure metal), in Kazakhstan, Central Asia, the Urals, the Transcaucasus, and other places. The country is also rich in zinc and lead (in Western Siberia, Kazakhstan, Central Asia, the Caucasus, and elsewhere); in nickel (taking second place in the world after Canada—the Urals being the principal nickel-yielding region); and in bauxites, the raw material for aluminum (found in the Urals, in the Leningrad district, and other places).

Exceedingly rich are the deposits of gold found both in auriferous

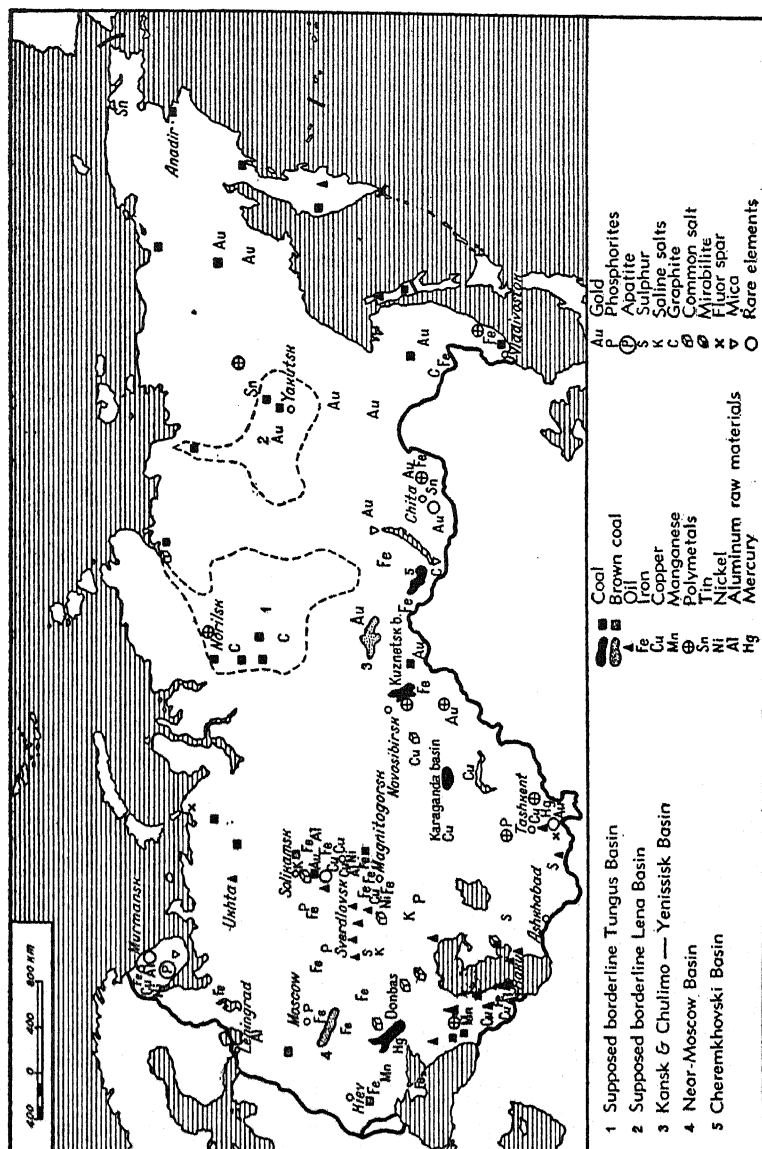
ores and in dust. The principal gold fields are in Siberia, the Far East, Kazakhstan and the Urals and in gold deposits, as well as in platinum deposits (in the Urals) the Soviet Union occupies first place in the world. Great deposits of world importance are the manganese ores—over 742.6 million tons—found in the Transcaucasus, the Ukraine, the Urals, and Western Siberia.

There are enormous deposits of so-called “agricultural ores.” Among the regions of phosphoric deposits is the quite exceptional Khibin region in the north of the European part of the USSR, where 2,000 million tons of apatite, a greenish friable mineral containing 40 per cent phosphoric oxide, have been prospected. Apatite is used for the manufacture of fertilizers and is also valuable in more than twenty different fields (in metallurgy, medicine, etc.). Mixed with apatite are deposits of nepheline, which also has over twenty uses: it is the raw material for aluminum, glass, potassium, fertilizers, tanning, and so on. The deposits of nepheline are virtually inexhaustible. Among the deposits of potassium salts in the USSR are the rich Solikamsk deposits in the Urals amounting to 18,400 million tons of potassium oxide. Large deposits of potassium were recently discovered in the south of the Left Volga Region.

There are inexhaustible deposits of salt in the Ukraine, in the Left Volga Region, in the Urals, in Siberia, and other regions. There is tin, molybdenum, wolfram, sulphur, bismuth, fluor spar, corundum, graphite, arsenic, antimony, mercury, and radium. Recently boron was discovered in Kazakhstan, the only element which the Soviet Union had previously lacked.

Map 5 (page 23) shows only the most important locations of the chief mineral deposits.

It must be borne in mind that so far only about half the country has been minutely investigated. The uninvestigated part of the country, which is today being thoroughly prospected, promises to yield new discoveries. Most valuable finds are made annually by the geological expeditions, and the figures relating to mineral deposits of every kind are growing from year to year. Within the past twenty years the prospected deposits of coal have increased sevenfold, of petroleum sevenfold, of zinc tenfold, of lead ninefold, of iron ores and ferriferous quartzites one hundred and thirty



MAP 5—CHIEF MINERAL DEPOSITS

times, of copper twenty-eight times. Potassium, apatite, and dozens of other minerals were discovered for the first time, and one might truly say that within recent years the mineral world of the USSR has been re-discovered.

But it is not only the depths of the earth in the USSR which are rich. Equally rich is the surface of the earth.

The Soviet Union possesses many regions with exceedingly rich soil. In the steppe and forest steppe zone, there are over 247 million acres of remarkable black soil land, which is the largest black soil region in the world, stretching a distance of nearly 3,100 miles. The black soils are characterized by their large quantity of vegetable mould, their lumpy structure, and dark color. They are extremely fertile. For the variety of crops they yield, these soils are unequalled. The depth of black soil is from $3\frac{1}{3}$ to 5 feet. It contains from 6 per cent to 10 per cent of organic mould, and in places this figure increases to 16 per cent, even to 20 per cent—as in the so-called “rich black soil,” which is found to the east of the Volga. The north of the country is rich in soils suitable for the growing of flax. In Central Asia the poplar becomes full-grown within four or five years on the irrigated grey soil; fruits ripen here which rank among the best in the world for their sugar content.

The forests are immensely rich and one-third of the forest land of the globe (nearly two and a half billion acres) lies within the borders of the USSR. The north and east of the country are covered with forests, extending for many thousands of miles. Under the cold skies, the timber grows up strong, small-grained, and resilient. The Soviet Union is the richest country in the world in conifers.

The Soviet forests yield Olonetz mast pines, Vologda firs, remarkable Far Eastern cedars, first-rate Chuvash oaks, Georgian bone-hard boxes, the famous aspen matchwood, and larches which have no substitute for underwater construction.

There are many fur-bearing animals in the forests and tundras of Siberia which yield the most beautiful and valuable furs in the world. There are sables, foxes, ermine, polar foxes, and many others.

The waters of the Soviet Union are rich as well. The rivers

and seas abound in every variety of fish. In the Okhotsk Sea alone, for example, there are thirty-four different kinds of industrially important fish.

Among the fish caught in various parts of the country are the sturgeon, whose roe (in the form of caviar) is a delicacy all over the world. When the salmon of the Far East—the Siberian and the humpbacked species—ascend the rivers in autumn to spawn, the water seethes with them. Countless multitudes of crabs move along the sea-bottom on the west coast of Kamchatka.

The power capacity of the rivers of the USSR is enormous—280 million kilowatts, which is 28% of the world resources and puts the country ahead of every other in its supply of cheap and permanent water power.

Mighty natural resources, vast expanses of territory, generous beneath the surface of the earth, a fertile soil, a population of one hundred and seventy million persons, of whom nearly one hundred million are adult workers: such is the wealth of the USSR. What has already been done to utilize it?

The Economic and Social Order

RUSSIA AND THE USSR

TSARIST RUSSIA was a country of unutilized potentialities. Only 10.3% of its territory was geologically explored. The level of labor productivity in industry, before the World War, was some 30% less than that in the United States in 1860, when slavery still existed. The country imported from abroad 20% of its coal, 22% of its wood pulp, 40% of its paper, 56% of cotton, 55% of superphosphates, 60% of machinery, 68% of copper, 90% of lead, 97% of zinc, 100% of aluminum. Even scythes were purchased in Austria and paving blocks for the streets in St. Petersburg were imported from Sweden. Agricultural technique was at a medieval level. There were ten million wooden plows, and the land yielded insignificant harvests. Sixty-five per cent of the village population consisted of poor peasants, most of whom wore plaited bast shoes.

Seventy-five per cent of the population was unable to read, and these were still the conditions two decades ago.

In October* 1917, in the fourth year of the devastating World War, there took place in Russia the Great October Socialist Revolution, organized and headed by the Communist Party whose leader was Lenin. Soviet power, the power of the working people, was established.

In the course of the next few years the land of the Soviets had to repel armed attacks by counter-revolutionaries and interventionists from all sides, and there were times when the enemy approached to within 125 miles of Moscow.

* October 25 according to the old style that existed in pre-Revolutionary Russia, and November 7 according to the calendar which obtains in most other parts of the world, and in the USSR now.

Bitter civil war and the economic blockade ruined the economy of the country, so that the index of the physical volume of industrial production (taking 1913 as 100) dropped to 13.8 in 1920.

But all attacks were repulsed; the Japanese interventionists were driven out of the Soviet Far East in 1922, and with this the Civil War came to an end. Economic reconstruction began, and in 1926 it attained the pre-war level.

However, the pre-war level was the level of a backward country, which was faced with this choice: either Soviet power must be able to lead the country from the path of the dark middle ages to the path of modern industry and mechanized agriculture and thus strengthen Socialism; or it would be incapable of doing this, in which case the country, technically weak and culturally backward, would lose its independence and become a toy of the imperialist powers.

Under the guidance of Stalin, the best pupil of Lenin and perpetuator of his cause, titanic work started for the reconstruction of the largest country in the world, a reconstruction without the help of foreign loans and under extremely backward conditions, in the face of unrelenting bitter resistance by counter-revolutionaries.

And these are the results: in 1938 the increase of industry in the USSR (1913 = 100) was equivalent to 908.8. In the same year the corresponding figure in the U.S.A. was 120; in England, 113.3, in Germany, 131.6; in France, 93.2. In volume of industrial production the USSR has outstripped France, Britain and Germany and has advanced to second place in the world, being surpassed only by the United States of America.

Soviet industry knows no crises. In 1938 the volume of industrial output in the USSR constituted 477% of the 1929 level, while the volume of industrial output of the capitalist world in 1938 was only 90% of the level of 1929, the first year of the crisis. The average yearly rate of increase of industrial output of the USSR in the Second Five Year Plan period was equivalent to 17.1%, making the rate of development of industry in the USSR the highest in the world. Since 1931 there has been no unemployment in the Soviet Union, although in 1928 there were 1,576,000 unemployed.

Collectivized agriculture in the Soviet Union has become the largest-scale, the most industrialized, agriculture in the world. The primitive plows and flails have disappeared and in their place nearly half a million tractors and over 150,000 harvester combines are in operation.

The country has become literate, having discarded its backward and medieval character. Its army, organized for the defense of peace, is equipped with a first-rate technique. An economy has been created which can ensure, without outside assistance, the production of all necessary machines and forms of raw material both for its further development and for war purposes, if such need should arise.

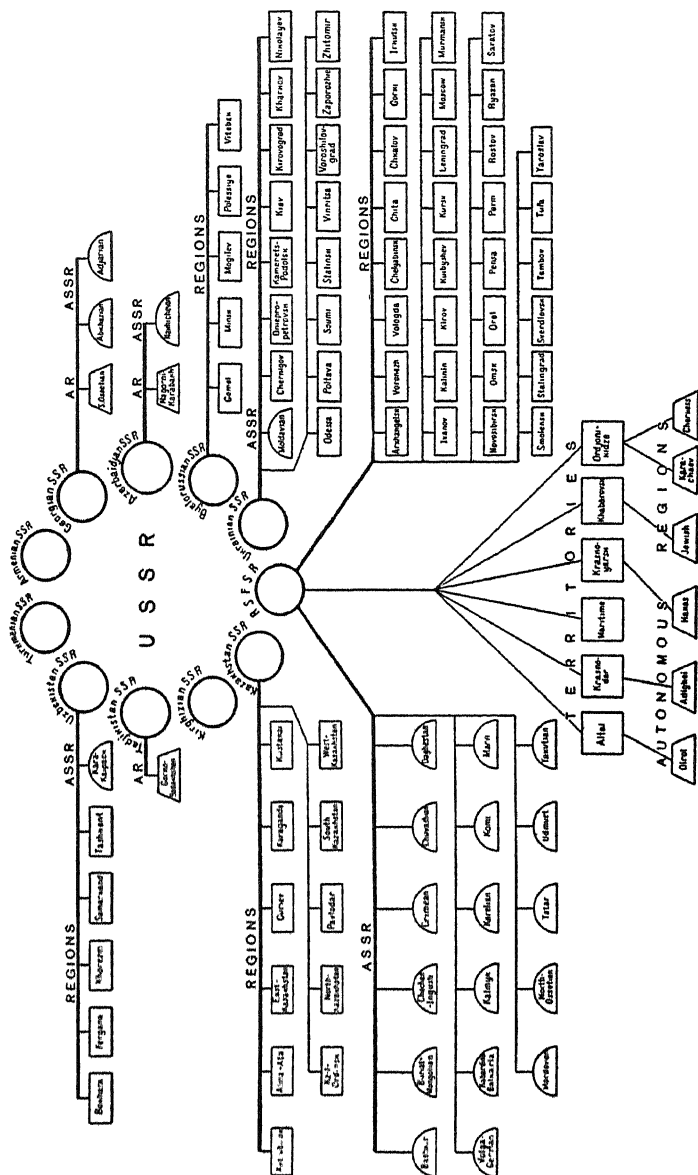
All this has been accomplished within two decades.

SOCIAL ORGANIZATION

The rapid growth of the national economy was the result of the new social forms. At the same time, the consolidation of the new social system depended on the development of the economy of the country. The social order of the land of the Soviets is fixed in the Constitution of the USSR, created under the leadership of Stalin.

More than 175 different peoples live in the USSR. Since the first day of the Revolution all of them have enjoyed absolutely equal rights. Any direct or indirect restriction of the rights of, or, conversely, the establishment of direct or indirect privileges for citizens on account of race or nationality, as well as the advocacy of racial or national exclusiveness or hatred and contempt, is punishable by law.

The Union of Soviet Socialist Republics (USSR) is a union state formed on the basis of the voluntary association of Soviet Socialist Republics, possessing equal rights. There are eleven of these republics: The Russian Soviet Federated Socialist Republic (6,375,000 sq. mi.). The Ukrainian Soviet Socialist Republic (171,950 sq. mi.). The Byelorussian Soviet Socialist Republic (48,960 sq. mi.). The Azerbaijan Soviet Socialist Republic (33,200 sq. mi.). The Georgian Soviet Socialist Republic (26,875 sq. mi.). The Armenian Soviet Socialist Republic (11,580 sq. mi.). The Turkmenian Soviet Social-



AR — Autonomous Regions

ASSR — Autonomous Soviet Socialist Republics

CHART 6—ADMINISTRATIVE DIVISIONS OF THE USSR

ist Republic (171,250 sq. mi.). The Uzbek Soviet Socialist Republic (146,000 sq. mi.). The Tajik Soviet Socialist Republic (55,545 sq. mi.). The Kazakh Soviet Socialist Republic (1,059,700 sq. mi.). The Kirghiz Soviet Socialist Republic (75,950 sq. mi.). The political and administrative division of the USSR is shown on chart 6 (page 29).

The jurisdiction of the USSR, as embodied in its highest organs of authority and of government, covers: representation of the Union in international relations, conclusion and ratification of treaties with other states; questions of war and peace; organization of the defense of the USSR and the direction of all the armed forces of the USSR; foreign trade on the basis of State monopoly; establishment of the national economic plans of the USSR and so on. With these exceptions as set forth in the Constitution, each Union Republic exercises State power independently. To each of them is reserved the right freely to secede from the USSR.

The Soviets of Working-Peoples' Deputies constitute the political foundation of the USSR. The highest organ of State authority of the USSR is the Supreme Soviet of the USSR. Election of deputies to all Soviets of Working Peoples' Deputies, including the Supreme Soviet of the USSR is effected on the basis of universal, equal and direct suffrage by secret ballot.

The socialist system of economy and the socialist ownership of the implements and means of production constitute the economic foundation of the USSR. Socialist property exists either in the form of State property or the form of cooperative and collective-farm property.

The land, its mineral deposits, waters, forests, mills, factories, mines, railways, water and air transport, banks, means of communication, large State-organized agricultural enterprises (such as State farms, machine-tractor stations and the like), as well as municipal enterprises and the principal dwelling-house properties in the cities are State property, that is, the property of the whole people. In 1936 this State property amounted to 90% of all the capital funds of the USSR.

Public enterprises and buildings in collective farms (agricultural artels) and cooperative organizations, with their livestock and im-

plements, products raised or manufactured by the collective farms and cooperative organizations, constitute the public, socialist property of the collective farms and cooperative organizations. In 1936 this property accounted for 8.7% of all the capital funds of the USSR.

The victory of Socialism in the national economy of the USSR may be expressed in the following figures: in 1937, at the end of the Second Five Year Plan period, the proportion of Socialist forms of economy in the entire national income of the USSR constituted 99.1%; in the gross output of all industry, 99.8%; in the gross output of all agriculture, 98.6%; and in the volume of trade, 100%.

Every collective farm household, in addition to its basic income from the public collective-farm enterprise, has for its own use a plot of land attached to the house and, as personal property, an auxiliary establishment on the plot, a house, produce animals and poultry, and minor agricultural implements—in accordance with the Statute of the Agricultural Artel.

The land occupied by collective farms is secured to them for their free use for an unlimited time, that is, forever.

In addition to the socialist system of economy, which is the predominant form of economy in the USSR, the law permits small private economy of individual peasants and handicraftsmen based on their personal labor and precluding the exploitation of the labor of others.

The class structure of Soviet society has greatly changed.

In the USSR there remain two friendly classes: the working-class and the peasants, as well as the intelligentsia. The differences between the working-class and peasantry, like those between these classes and the intelligentsia, are being obliterated, and the old class exclusiveness is disappearing. There is no class in the USSR that lives by the toil of others.

In the USSR, work is a duty and a matter of honor for every able-bodied citizen. Citizens have the right to work, namely, the right to guaranteed employment and payment for their work in accordance with its quantity and quality. The right to work is

ensured by the Socialist organization of national economy, the steady growth of productive forces, the preclusion of any possibility of economic crises, and the abolition of unemployment.

CLASS COMPOSITION OF THE POPULATION OF THE USSR

(In percentage to the total)

	1913	1937
Industrial, office and professional workers	16.7	34.7
(Among them workers and employees of State Farms and Machine Tractor Stations (in 1937), 3.2		
Collective farmers and cooperative artel artisans and handicraftsmen	55.5
Individual peasants (no kulaks) and non-cooperative workers, artisans and handicraftsmen	65.1	5.6
Bourgeoisie (landowners, large and petty urban bourgeoisie, merchants and kulaks	15.9	...
(Among them kulaks (in 1913), 12.3		
Rest of the population (students, pensioners, army, etc.)	<u>2.3</u>	<u>4.2</u>
	100.0	100.0

Citizens of the USSR have the right to rest. Rest and leisure are ensured by the reduction of the working day to 7 hours for the vast majority of the workers. In 1913 the working day in large-scale industry averaged 9.9 hours, while in 1928 it was 7.48 hours and in 1934 only 6.59 hours. The work day of younger workers is between 4 and 6 hours, while the labor of young children is prohibited. Rest is further ensured by annual vacations (not less than two weeks) with pay, for workers and office employees, and the provision of a wide network of sanatoria, rest homes and clubs for the working people.

In 1936, nearly two million factory and office workers spent their vacations in sanatoria and rest homes where they were accommodated free of charge. In addition, hundreds of thousands of persons receive free sanatorium treatment and rest at the expense of enterprises and institutions where they work.

Citizens of the USSR have the right to maintenance in old age and also in case of sickness or loss of capacity to work. This right is ensured by a wide system of social insurance at State expense, and by free medical service for all working people.

Citizens of the USSR have the right to education. This right is ensured by universal, compulsory elementary education; by the

fact that education, including higher (university) education, is free of charge; by the system of State stipends for the overwhelming majority of students in universities and technical schools (in 1936, 87% of the students received monthly incomes); by the establishment of schools conducted in the languages of the various nationalities, and by the organization of free vocational, technical and agronomic training for the workers in factories, State farms, machine-tractor stations and collective farms.

Women in the USSR are accorded equal rights with men in all spheres of economic, State, cultural, social and political life. The possibility of exercising these rights is ensured by affording women equally with men the right to work; to equal payment for work; rest and leisure, social insurance, and education, and by State protection of the interests of mother and child, maternity leave with pay, and the provision of a wide network of maternity homes, public nurseries and kindergartens.

Women in the USSR constitute approximately 35% of the total number of factory and office workers, 30% of the scientific workers, 48% of the physicians, 41% of the students in higher educational establishments. Women manage large enterprises as well as entire branches of the national economy. There are women members of the Academy of Sciences of the USSR. By the beginning of 1938 there were 1,518 women who had been decorated with "Orders" for achievements in the economic and industrial field, in science, art, and high administrative posts. At the present time the number of women decorated with "Orders" is considerably larger. Of the 33 international women's records, 11 have been made by Soviet girl members of the Young Communist League. One hundred and eighty-nine women have been elected to the Supreme Soviet of the USSR—the highest organ of State authority. Eight hundred forty-eight women have been elected to the Supreme Soviets of the Union Republics, and 588 to the Supreme Soviets of the Autonomous Republics.

From the middle of 1936 to the end of 1937 mothers of large families in the USSR received, according to the law, State grants totalling 1,778 million rubles.

Private profit is not the mainspring of economic activity in the

USSR. Economic activity is determined and directed by a State plan based on the interests of the national economy as a whole. Its aim is the increase of social wealth, the continued rise in the general standard of living and culture, the strengthening of the independence and defense of the country.

The plan is prepared on a scientific basis; it embraces and links up all branches of economics. Enterprises receive their planned tasks and are responsible for their fulfillment. The scope of work is such that everyone finds a task for his strength and his initiative. Workers are stimulated by the consciousness that they are laboring in the common interests, and consequently, in their own interests as well.

Chkalov, the Soviet pilot, after his flight from the USSR to the United States via the North Pole, in a conversation with an American, defined the essence of the Soviet economic system in the following words: "One hundred and seventy million people are working for me, just as I am working for them."

INDUSTRY

Tsarist Russia was an agrarian country; the USSR has become an industrial country. The output of industry in the USSR increased from 11,000 million rubles in 1913, the last pre-war year, to 100,400 million rubles in 1938 (in 1926-27 prices). In 1913, the industry of the country was responsible for 42.1% of the production of the national economy, while in 1937, at the end of the Second Five Year Plan the figure rose to 77.4% notwithstanding the absolute growth of the production of agriculture. In the USSR both sides of social production—industry and agriculture—are now well developed.

In volume of industry Russia in 1913 held fifth place in the world; the USSR now is first in Europe and second in the world. More than 80% of the total output of industry of the USSR in 1937 was produced by new enterprises built or entirely reconstructed within the period of the First Five-Year Plan (1927/8-1932) and of the Second Five-Year Plan (1933-1937).

In pre-revolutionary Russia heavy industry existed, but light in-

dustry, particularly the cotton textile industry, predominated. In the structure of Soviet industry the leading place belongs to heavy industry, the proportion of its output in the total industrial output having increased to 60.8% by 1937. The textile and food industries, while increasing in absolute figures, are still behind machine-building, whose proportion in the output of large-scale industry has increased from 6.8% in 1913 to 25.7% in 1936.

In tsarist Russia industry was distributed extremely unevenly. Fully half of the industrial output was produced by the so-called "old industrial center"—the regions around Moscow—and St. Petersburg (now Leningrad). Here were concentrated spinning and weaving, metal working and chemical production. Almost a third of the output was produced in the Ukraine and the Urals. Industry in the Ukraine did not grow beyond its foundation: metal was produced and coal mined here, but the production of chemicals and the metal working industry lagged behind. The Urals smelted iron in old furnaces, but the greater part of it was carried out without being worked up. An important, but quite isolated industrial center was Baku in the Transcaucasus where oil was extracted.

Industry in the rest of Russia was quite insignificant. To the east of the "industrial center" (which was not in the "center" of the country, but on one side, in the west) were the agrarian regions. Flour mills in the Volga Region, lead mines in the Altai Region and goldfields in Siberia were petty islands in a backward rural country. Western Siberia and Kazakhstan, for example, accounted for only 0.5% of the output of Russian industry.

In the USSR new industry has been created, and with it new distribution. The construction plan mapped out not only "what" but also "where": at the XVIth Congress of the Communist Party (in 1930), Stalin gave first place among the new economic tasks to the problem of the rational geographical distribution of production. New principles of distribution of industry were laid down.

In the Socialist country each region has an equal right to a full life, and to its mainstay—industry. In order to develop the previously backward regions, the plan of industry provides for its more *even* distribution. This means that industrialization of previously agricultural provinces is proceeding rapidly. For instance,

during the First Five Year Plan period, the industrial funds of the center increased by 87%, while in Central Asia the increase was 277% and in the Urals and Western Siberia 285%. The difference in pace lessens the difference in level of development. The growing center has become a support for the industrialization of the still more rapidly growing provinces. As a result of this there are no longer any purely agrarian regions in the Soviet Union. All regions are now more or less industrial.

Political equality of all peoples inhabiting the USSR was proclaimed in the very first days of the Revolution. But to destroy inequality *de facto* it was necessary to do away with the economic backwardness of the national (previously oppressed) outlying sections of Russia. To this end the national Soviet republics and regions are being rapidly industrialized. New technically up-to-date enterprises are being constructed in those places and are effecting the transformation of their patriarchal mode of life.

In choosing the sites of new works and factories the task set by Lenin was being solved: the task of creating "a rational distribution of industry in Russia from the point of view of the proximity of raw material and of the possibility of the minimum loss of labor in the transition from the working up of the raw material to all consecutive stages in the production of semi-manufactured articles right up to the obtaining of finished products." Previously all the raw material was transported from the provinces to the center in order to manufacture it into commodities, after which a considerable part of these goods were brought back to the very same provinces. This gave rise to unproductive transport charges. Today districts with raw material are acquiring their own manufacturing industry. A rational distribution of industry from the point of view of the entire national economy is being created. The distance for transportation of products is shortened, social labor is saved, and its productivity increases.

The even distribution of industry, the rapid industrialization of national and previously backward districts, the working-up of raw material near the place where it is obtained, the abolition of the contradictions between village and town—the application of all these socialist principles of distribution have fundamentally changed

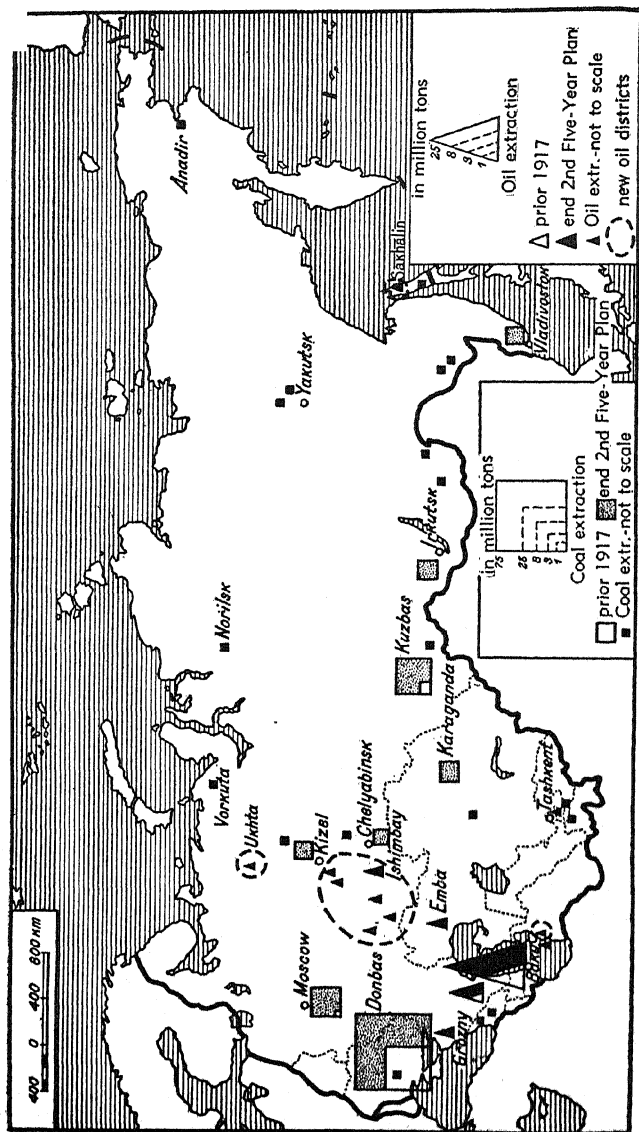
the character of regions and have created a new economic geography of the country.

In the USSR each branch of industry has grown and changed its distribution. In 1913 the quantity of coal mined amounted to 29,100,000 tons, and in 1938 to 132,900,000 tons, an increase of more than 350%.* The coal industry has been radically reconstructed; the proportion of mechanized mining has increased from 1.7% to almost 90%. For mechanization of coal mining, the USSR has taken one of the first places among all countries. For the first time in the world underground gasification of coal is being developed on an industrial scale, a process which allows fuel to be utilized in the most convenient form, that of gas, without the application of the arduous labor of miners. For example, gas from the Moscow Coal Basin will be transmitted over a distance of 125 miles to Moscow.

Prior to the Revolution the largest supply of the coal (87%) was obtained from the Donbas (Donetz Coal Basin) in the Ukraine. Russia was doomed to dependence upon a single coal base. Today new coal mining districts have been established, of which the most important are Kuzbas (Kuznetsk Coal Basin) in Western Siberia (in 1938 this coal basin produced 13% of the entire output of the USSR), the Moscow Coal Basin (a coal mining district near Moscow which produced 6% of the output in the country), Karaganda in Kazakhstan, Vorkuta in the Pechora River Basin, the Cheremkhovo Basin in Eastern Siberia, Tkvarcheli in the Transcaucasus, and others. Though the output of coal in the Donbas in absolute figures has increased more than threefold as compared with pre-revolutionary Russia, the proportion of the Donbas to the total output of the country has dropped to 58.9%. (See Map 7, page 38.)

In 1913 the output of oil amounted to 9,200,000 tons, and in 1937 to 30,500,000 tons, or an increase of more than threefold. The proportion of mechanized oil extraction has increased from 5.9% to

*In comparing the economics of the USSR with those of pre-war times, it must be remembered that the 1913 level was reached only in 1926 when the last consequences of the War, intervention, and economic ruin were overcome; so that the main growth of the economics of the country took place in the years of the Five Year Plan periods (1928 and later).



MAP 7—LOCATION OF THE FUEL INDUSTRY

98%. In pre-revolutionary Russia 62% of the oil extracted was manufactured into oil products; in the USSR, more than 90%. The output of benzine had increased twentyfold by 1937. In the volume of output of oil the USSR holds the second place in the world, the United States alone preceding it.

In the oil industry the Caucasus held almost undivided sway before the Revolution: it produced 97% of the oil output (Baku 84% and Grozny 13%). The Caucasus continues to remain the most important oil district in the country, but in addition to it, new large oilfields have been opened up at Emba (on the north-east coast of the Caspian Sea), at Oukhta (in the Pechora Basin), in the Fergana Valley (Central Asia), and in Okha (on Sakhalin Island). The development of a new oil district in the centre of the country—between the Urals and the Volga—will be of enormous importance; here oil is already obtained in Ishimbayev, Krasnokamsk and at Kuibyshev. (See Map 7, page 38.) Pipe lines have been laid from Baku to the port of Batumi on the Black Sea, from Grozny to the port of Tuapse on the Black Sea, and to the Donbas, from Guriev (on the Caspian Sea) to Orsk (in the Southern Urals) and elsewhere.

In 1913 the output of pig-iron amounted to 4,200,000 tons and in 1938 to nearly 15,000,000 tons, an increase of 3.5 times. In 1913 the production of steel amounted to 4,200,000 tons, and in 1938 to 18,000,000 tons, an increase of more than fourfold. In pig-iron and steel output the USSR has taken second place in Europe. There has been created an up-to-date iron and steel industry with blast furnaces, ranking among the largest in the world, with electric smelting works, with powerful rolling mills—blooming mills. Following the U.S.A., a slabbing mill has been installed in one of the factories. Production of iron alloys has been introduced. By the beginning of 1937, the number of powerful blast furnaces, each with a capacity of over 28,250 cu. ft., constructed in accordance with the latest technical methods and all entirely mechanized, was more than 22% of all the blast furnaces in use in the iron and steel industry of the USSR; while in the U.S.A. the number of such blast furnaces was 12% and in Germany only about 3%. A method of blast furnace smelting with anthracite has been invented. During the period of

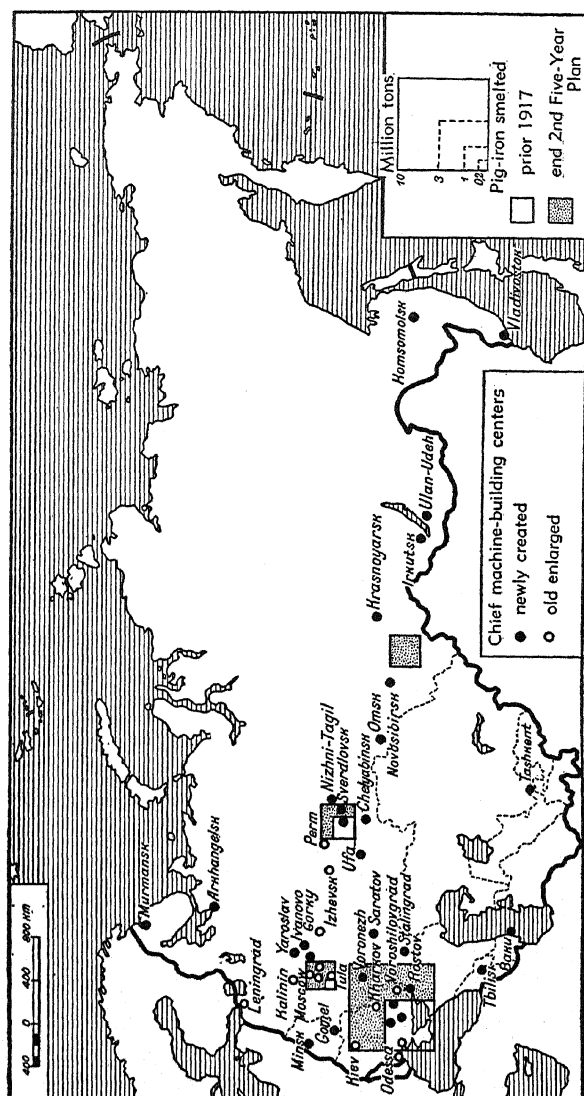
the Second Five Year Plan the USSR advanced to first place in the world for output of electric steel, producing 860,000 tons in 1937 (against 846,000 tons in the U.S.A.).

Like all other industry, the iron and steel industry has advanced to the east. (See Map 8, page 41.) The south of the European part of the USSR was the coal-metallurgical base of Russia; as compared with 1913, pig-iron smelting in 1937 increased three-fold in this region, but the proportion of the entire south in pig-iron smelting of USSR dropped from 73.6% to 63.6%. In the east a second coal-metallurgical base—the Ural-Kuznetsk Combine, a combination of the iron ore from the Urals and the coal from Kuzbas—has been created. Metallurgy in the Urals has been enlarged, and in the eastern part of the Combine, in Kuzbas, metallurgy has been created anew, its proportion of output rising from zero to 10.4%. The proportion of the output of the iron and steel industry in the central regions has risen from 4.9% to 7.9%. An iron and steel industry is also being created in the Far East.

Copper production has been increased, its main center being the Urals; although copper is also produced in Kazakhstan (this district will greatly advance in the near future), Armenia, and the Kola Peninsula. The production of lead and zinc (in Kazakhstan, in the North-Caucasus, in Western Siberia, and other districts), has been extended. For the first time the production of aluminum has been established (in the Ukraine and near Leningrad), and now occupies second place in Europe. Nickel is obtained in the Urals and on the Kola Peninsula, tin in Eastern Siberia, magnesium in the Ukraine and in the Urals, tungsten in Eastern Siberia, molybdenum in the North Caucasus. Antimony, cadmium, vanadium, selenium, tellurium and other elements are being extracted.

For the output of gold the USSR has advanced from fourth place in the world to second, the country in first place being the Union of South Africa. The previous semi-handicraft gold mines have been transformed into large-scale industrial enterprises. Works have been established which produce equipment for the gold industry (in Siberia). The principal gold-mining regions are Siberia, the Far East, the Urals, and Kazakhstan.

The fundamental technical reconstruction of all branches of in-



MAP 8—LOCATION OF FERROUS METALLURGY AND MACHINE-BUILDING

dustry was ensured by the exceedingly rapid growth of machine building. New branches of this industry have been created: production of tractors, automobiles, of airplanes and other flying machines, etc. The manufacture of all sorts of complicated machine lathes, instruments, and automatic machines is developing. Soviet industrial equipment is the most up-to-date: for instance, no more than 25% of the machine lathes in use are over ten years old, whereas in the United States, the most technically advanced country, such machine lathes number over 60% of the total. Machine building is growing more rapidly than industry as a whole. By 1937 the output of Soviet machine-building had increased 28-fold. Machine building has advanced from fourth place among the various branches of industry to first place. For the total volume of machine building, the USSR has outstripped all European countries and follows directly behind the United States, but for the production of agricultural machinery and engines, the USSR has outstripped the U.S.A. In developing such a machine-building industry the USSR has attained independence in the decisive branch of the national economy. Any necessary machine can now be produced in the USSR.

In tsarist Russia machines were built in the center in St. Petersburg and partly in the Ukraine. The East remained a land without machine building. Now the old districts have extended machine building, especially the construction of complex and precision machines, and at the same time the industry has spread all over the country. It has been created even in the most distant and previously extremely backward regions, such as Siberia, the Far East, Central Asia and so on. Machine building plants in the USSR, under the plan, are specialized and cooperate with each other. The most important centers of machine building are shown on map 8, page 41.

In pre-revolutionary Russia the chemical industry was considered more a supernatural wonder, a trick of foreigners, than a branch of production. A greater part of the few chemical enterprises in existence belonged to foreigners and worked on foreign raw material.

In the USSR chemistry has grown into a powerful branch of the national economy. Its base lies in the immense mineral deposits and in the waste of other industries. For the production of superphosphates, for example, the country has advanced from thirteenth to first place in Europe. New nitrate, coke-chemical, aniline dyes, pharmaceutical, potash, apatite and other branches of chemistry have been created as well as plants for the production of artificial fiber, liquid fuel, composition material, etc. The difficulties of mastering production new to the country have been surmounted, and by 1937 the output of the chemical industry had increased 13.6 times.

In 1931 Stalin said: "We have everything, except perhaps, rubber. But within a year or two we will have our own rubber as well."

And indeed the greatly increased demand for rubber in the USSR—a result of the rapid development of automobile construction—is now being met chiefly by the home production of synthetic rubber, which is made in a number of large works out of alcohol obtained from potatoes (in Yaroslavl, Voronezh, Kazan and other places). The manufacture of synthetic rubber from limestone is also being established (in Erevan), and in the production of synthetic rubber the USSR now stands first in the world. The cultivation of rubber plants is conducted on a large scale.

The food industry and light industry are developing rapidly. By 1936, the output of the food industry of the USSR, in volume of production, already exceeded the entire large-scale industry of tsarist Russia (12,900 million rubles against 11,000 million rubles). Food products for the market are prepared in the USSR according to American methods, but so far on an insufficient scale, taking into consideration the size of the country and the rapid growth of its needs.

During the Soviet years factory production of footwear increased twentyfold. During the Second Five Year Plan alone the production of articles of general consumption more than doubled. In the case of a number of important products and articles of general consumption output has trebled. Light industry, however, does not yet fully meet the demands of the population which are increasing

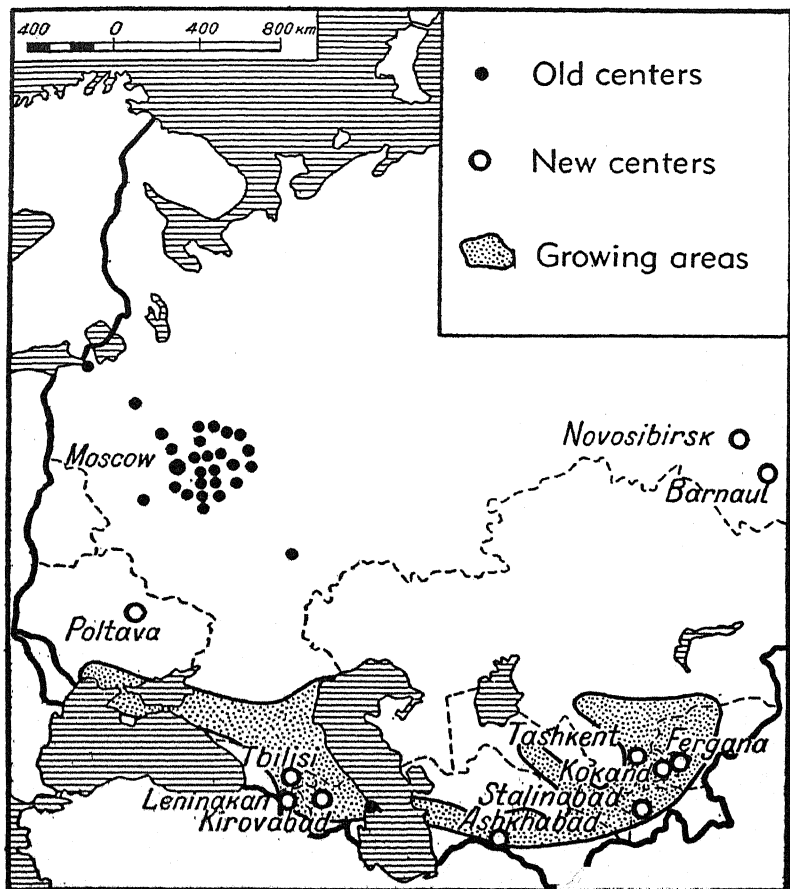
at a rapid pace as a result of the rise in the income of collective farmers and in the wages of workers in factory and office.

Here is one individual example: pre-revolutionary Russia did not manufacture upright and grand pianos, importing them entirely from abroad. In the USSR these musical instruments are manufactured, but the production total of this new industry is still inadequate. In 1935 there were 5,100 of these instruments produced, but in that year 2,000 workers of the Red Putilovets Plant in Leningrad expressed their desire to purchase upright pianos. This from only one factory in one city!

Distribution of light industry and the food industry is being changed with a view to distributing it more evenly and bringing it nearer to the raw material. For instance, cotton mills were concentrated in the central regions of the country far from the cotton-growing districts; but now, for the first time, cotton mills have been established in the cotton-growing districts in the south of the USSR, in Central Asia and in the Transcaucasus (see map 9, page 45). Sugar refineries were entirely concentrated in the west of the country: in the Ukraine and partly in the Kursk Region. Now, for the first time, a sugar industry has been created in the Volga Region, in the North Caucasus, in the Transcaucasus, in Central Asia, and in the Far East.

The USSR is provided with inexhaustible timber resources, the quantity of timber consumed yearly being less than the annual growth. With the growth of the timber industry, its geography is also changing. From the central districts the timber industry is advancing to the north, to the northeast and also the east, in the regions where the immense forests are as yet little exploited. In this way timber felling is carried on in greater conformity with the natural growth of trees, new industrial centers are provided with timber material, and centers of technical culture are created in the previously backward taiga districts. The expanding timber industry, however, still lags behind the needs of national economy, which, in view of rapid construction, are constantly increasing. There is also an increased demand for the products manufactured from timber, especially paper, since books in the USSR are being published in unprecedentedly large editions.

A Central Administration for Preserving Forests and Tree Planting has been established. For the safeguarding of rivers, forest zones have also been set apart where timber felling is prohibited.



MAP 9—LOCATION OF THE COTTON INDUSTRY

To protect the fields from dry winds special forests are planted in the drought regions—the Volga, the Northern Caucasus, and others.

After the Revolution, electrification became the means of trans-

ferring the economy of backward Russia to the firm technical base of large-scale Socialist production. "Communism is Soviet power plus electrification of the whole country," said Lenin. In the Soviet Union, where there is no private ownership of the land, it is easy to choose the best site for building an electric power station and to utilize natural resources to the best possible advantage. Here, where economy is developing according to plan, it is easy to map out the dimensions of an electric power station so that if need be its designed capacity may be increased to a maximum; and the line of transmission may be laid in any direction and any enterprise may be connected with it, the sole consideration being the interests of national economy as a whole. The construction of an electric power station and of enterprises consuming its power is planned in advance and they are built simultaneously.

The First Five Year Plan period saw the completion of the first electrification plan drawn up under the direction of Lenin in 1920. Two hundred eminent Soviet scientists and engineers participated in the preparation of this plan known as the GOELRO (State Commission For the Electrification of Russia) plan. The plan provided for the construction of a number of large electric power stations with a total capacity of 1,700,000 kw. within a period of 10-15 years. The GOELRO Plan, which Lenin called the second program of the Communist Party, was likewise the first plan for the restoration and reconstruction of the national economy of the country. The GOELRO Plan was drawn up in the period of extreme ruin resulting from war, and many sceptics who considered themselves all-wise regarded this plan as groundless and fantastic. But reality surpassed "imagination." By the end of its 15-year period, the GOELRO Plan was not only fulfilled, but overfulfilled by nearly 150%. Maps 10a and 10b, (pp. 48 & 49) show how the country has changed in the matter of its available electric power stations in comparison with 1920—the year of the drafting of the GOELRO Plan.

The quantity of electricity generated in the USSR in 1938 amounted to over 39,000 million kilowatt-hours as against 1,900 million in 1913—more than a twentyfold increase. The Dnieper hydro-electric power station alone generates yearly more electric energy than was generated by the whole of tsarist Russia. In output

of electric energy the country occupied fifteenth place in the world in 1913, while at present the USSR holds third place.

In the USSR, as a result of the better utilization of the electric power capacity per kilowatt, electric energy is generated between 1.5 and 2.5 times more than in the most highly developed countries in the world. In 1936 the utilization of district electric stations in the USSR was equivalent to 61.4%. In the same year the utilization of the capacity of electric stations in the United States was equivalent to 35.6%, in Germany (in 1935) 28% and in England (in 1934) 22.8%.

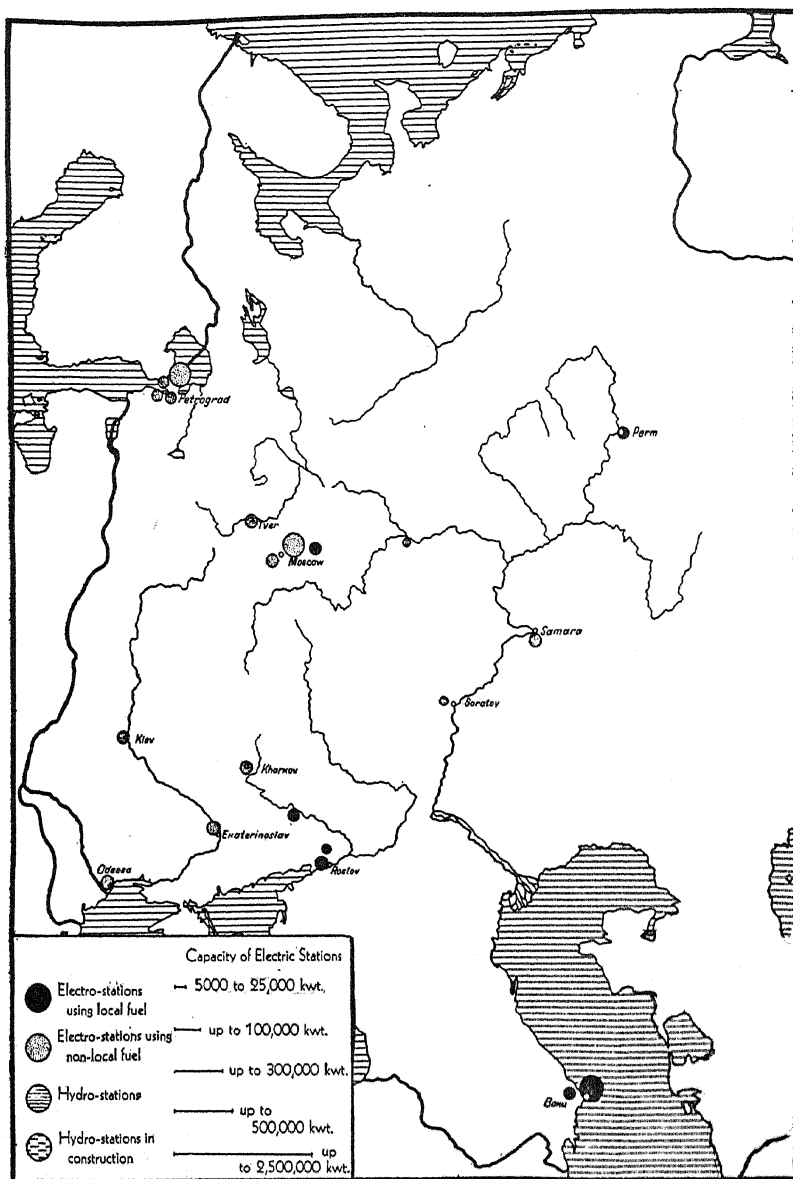
In pre-revolutionary Russia only a few, very weak, electric power stations, situated in large centers—St. Petersburg, Moscow, and Baku—were of industrial importance. In the main these stations were fed by the highly calorific oil of Baku, and the coal of Donbas. The fire of the furnaces swallowed up precious products capable of serving as chemical raw material and blast furnace fuel. Even the Baku electric power stations worked on oil when they might have worked on gas. Peat, lignite, and fuel shales were lying unutilized. As for hydro-electric power stations, they were almost unknown in tsarist Russia.

The new electric power stations of the USSR are working on local inexpensive energy. Those, for example, near Moscow—on lignite and peat; near Leningrad—on the force of waterfalls; in Donbas—on coal dust; in Baku—on natural gas. The increased importance of local fuel and hydro-energy in the feeding of Soviet electric power stations is clearly revealed on maps 10a and 10b (pp. 48 & 49).

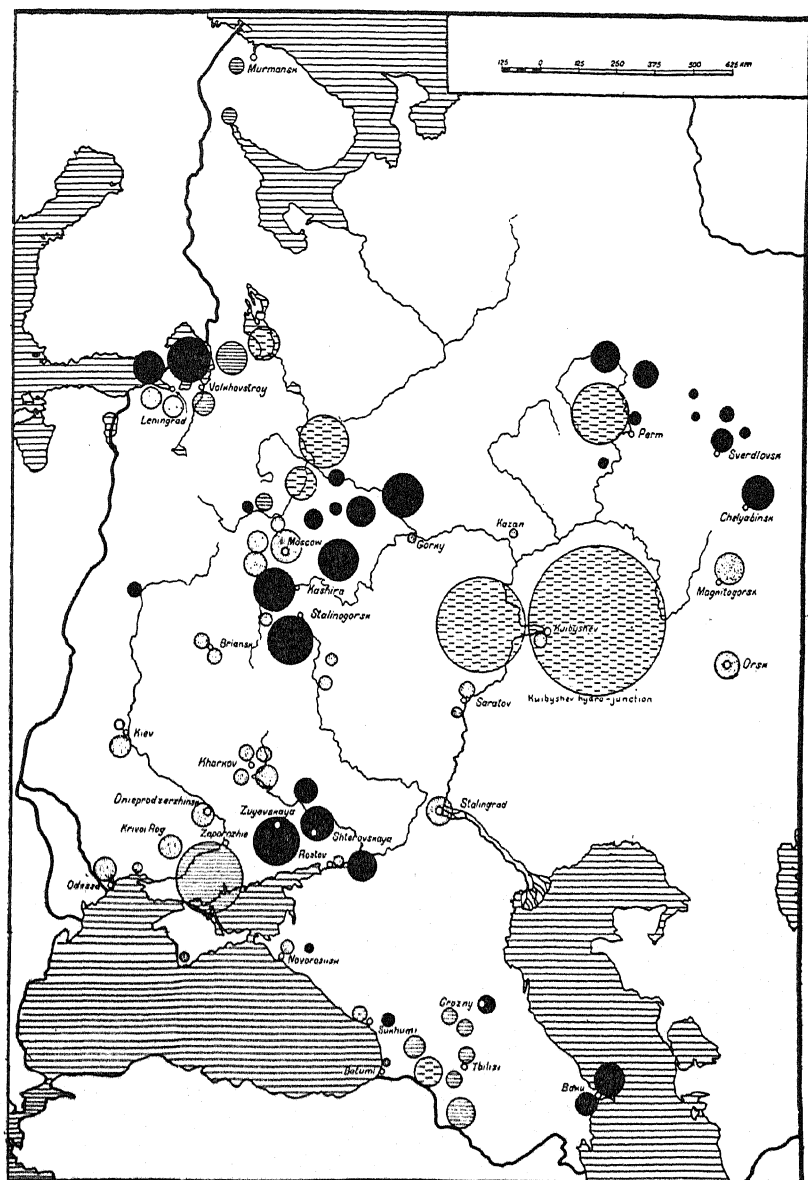
In large cities and at large industrial enterprises many heat-and-power stations have been built which simultaneously provide both electric energy and heat.

In the USSR, electrification is tending towards the establishment of a unified high voltage power network. In the Soviet Union there are no social obstacles to the unification of the electric stations into a single system. The stations do not belong to private individuals but to the State, so each of the large stations is essentially a station for general use.

Several powerful district electric systems have already been established in the USSR, as for example, the Moscow power system



MAP 10a—ELECTRO-STATIONS IN 1920



MAP 10b—ELECTRO-STATIONS IN 1937

uniting the stations of Moscow and adjacent regions, the Urals system stretching for more than 435 miles, the Leningrad and other power systems. With the construction of the hydro-electric power junction on the Volga, at Kuibyshev (3.4 million kw.) the stations in the Volga Region, in the Urals and in the Moscow district will be joined in one ring and form a vast power grid. The USSR is still far behind the U.S.A. as regards the total length of its high-voltage transmission lines.

A unified high voltage power network will be able to supply electric energy to the entire national economy, will enable the power resources of the country to be utilized irrespective of their geographical position, will mitigate the unevenness of the pressure and work of the stations at various times of the day, and will considerably reduce the transportation of fuel, since it will be replaced by the transmission of electric energy.

Speaking on the advantages of planned electrification, an American engineer said:

"Planned electrification differs from modern stations functioning separately just as a domesticated elephant differs from a wild one. The first is the friend and assistant of man; the second roams at large and may be a dangerous enemy. Society must place itself on the neck of the elephant and direct its movements, and not uselessly loiter about on the ground between its legs."

AGRICULTURE

In pre-revolutionary Russia nearly half the agricultural lands belonged to landowners, monasteries and the royal family. The rest of the land was divided and scattered among many millions of peasant households. Soviet power abolished private ownership of the land and handed over to the peasants more than 375 million acres that formerly belonged to the churches, the tsarist family, and the landowners; and in addition, the land that was already in the hands of the peasants.

Any rise in the level of backward agriculture, or the general industrial development of the country which is so closely connected with it, was impossible on the basis of small and petty peasant

farming which was powerless to adopt and to master the new technique, to raise the productivity of labor and to increase sufficiently the output of its marketable produce. This rise in the level of agriculture could be attained only by enlarging the scale of agriculture, by establishing large agricultural enterprises—State farms—(“sovkhozes”), and by uniting the scattered laboring peasant households into collective farms (“kolkhozes”).

On Stalin's initiative the XVth Congress of the Communist Party (in 1927) proclaimed the slogan of collectivization of the agricultural economy, which has since been carried into effect. The bitter resistance of the capitalist elements in the village was broken. The successes of industry which supplied the village with agricultural machines, the organization of State farms which became for the peasants models of large-scale Socialist agriculture, and the financial support by the State, resulted in the accomplishment of this most difficult task.

Today 93.5% of the peasant households are united in large collective farms on the basis of collective labor and collective ownership of the means of production. The collective farms hold over 99% of the peasant sowing area, and individual farming now occupies an insignificant place in the village. In 1937 there were 243,700 collective farms uniting 18,500,000 peasant households in the USSR. On the basis of wholesale collectivization, the capitalist elements in agriculture (the kulaks) as a class have been abolished.

The land has been secured to the collective farms forever, and a law prohibits the reduction in area of the land of collective farms.

More than 4,000 State farms—which may be termed large-scale grain and meat producing units—have been organized. Agriculture in the USSR is conducted on the largest scale in the world: on an average, one State farm has at its disposal 6,676 acres, and one collective farm—1,228 acres. In the United States the average area per farm amounts to about 50 acres.

In tsarist Russia petty peasant farming stood at a barbaric level of technique, and technical progress on the landowners' estates was retarded by the inefficient work of cheap hired labor.

In the USSR there were 483,500 tractors in 1938, which performed

four times as much work as tractors in the United States, although there are more tractors in the U.S.A. than in the USSR. There were 153,500 harvester combines in the USSR in 1938 (in 1936 in the U.S.A. there were 60,800 combines, while in England, Germany, and France—in 1937—there were only 186). In order to introduce the most advanced technical methods into the collective farms, more than 6,000 State Socialist enterprises of a special type—machine and tractor stations—have been established. These stations, by agreements with the collective farms, render technical and organizational assistance to the collective farms and are economic and political organizers in agriculture. In the USSR in 1937 71% of the work of tilling the land under spring crops was mechanized (1% in 1928); 42.8% of the harvesting of the grain (.2% in 1928); 94% of the threshing of the grain (1.3% in 1928); 79% of the digging out of sugar beet (0 in 1928).

Agriculture of tsarist Russia was backward and extremely unproductive while in the USSR agriculture has now become mechanized, modern, productive, its produce highly marketable, and its crop yield steadily increasing.

GROSS PRODUCTION OF GRAIN AND INDUSTRIAL CROPS IN THE USSR
(In Thousands of Metric Tons)

	1913	1934	1935	1936	1937	1938	1938 in percentage of 1913
Grain	80,100	89,400	90,100	82,730	120,280	94,990	118.6
Cotton (raw) ..	740	1,180	1,720	2,390	2,580	2,690	363.5
Flax (fiber) ...	330	530	550	580	570	546	165.5
Sugar beet	10,900	11,360	16,210	16,830	21,860	16,680	153
Oil seed	2,150	3,690	4,270	4,230	5,110	4,660	216.7

Agriculture in the USSR knows no crises. The collective farms may produce as much agricultural produce as they like without worrying about what they will do with it tomorrow. The Soviet State, through the State Bank, pays the collective farms in full for all the agricultural produce supplied to the State, without any limitations whatsoever.

By the end of the Second Five-Year Plan, the area under crop in the USSR had increased by 29% as compared with 1913; from 259

million acres to more than 334 million. The chief task now is further to increase the harvest yield.

The structure of agriculture is changing. The proportion of industrial and fodder crops in the total sowings is rising.

Grain farming still remains of exceptional importance in the USSR and in 1935 Stalin put forward the task of achieving in the very near future a yearly production of grain of from 253 billion to 289 billion pounds, and in 1937 264 billion pounds were harvested in the USSR. In tsarist Russia only about 144 to 180.5 billion pounds of grain were harvested yearly.

In 1938 agriculture in the USSR met with certain difficulties connected with summer drought in the Volga Region and in some of the adjacent regions, and yet the total grain harvest was greater than in 1935 and 1936 and only a little less than in 1937 when the USSR had a record harvest. In regard to grain, the Second Five Year Plan has been fulfilled before schedule.

Together with the change in the structure of the sowing areas, a planned specialization of agricultural regions is taking place in the USSR. Each of these regions is specializing in those crops which suit its nature and economy, and distribution of crops is carried out in the interests of the national economy as a whole.

But specialization in the USSR does not mean development of a single crop in a district, which would exhaust the fertility of the land. Together with the leading crop other plants are included in crop rotation, which is carried out scientifically. Rotation of crops restores the fertility of the soil.

Every region develops its own food base, which reduces the necessity for long hauls. For instance, by a government decision, all regions are obliged to grow sufficient potatoes to supply their local population fully, so that the need for long distance railway transportation of potatoes may be eliminated.

* * *

Wheat is the principal grain grown in the USSR. It occupies a huge area: 78,085,000 acres in 1913, and 102,258,000 acres in 1937. For its wheat acreage the USSR takes first place in the world. Many

of the species of wheat grown in the Soviet Union are of the highest quality and suitable for export.

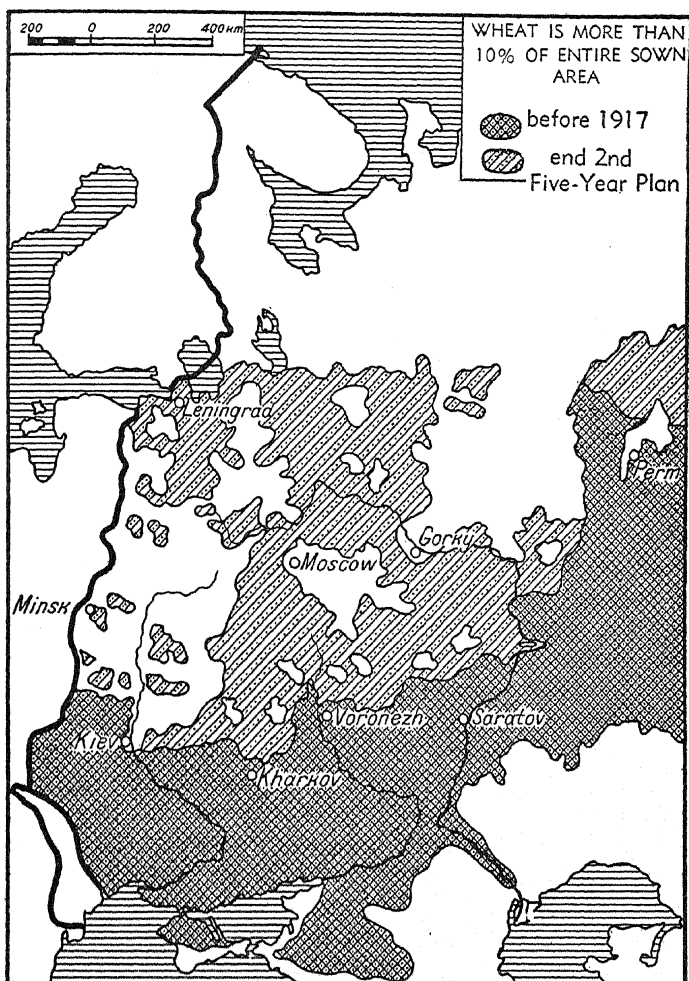
The wheat zone corresponds in the main to the zone of black and brown soils: the Ukraine, the steppe region of the Crimea, the North Caucasus, the Volga Region, the Southern Urals, and the central regions of Western Siberia. Within recent years great changes have taken place in the geography of wheat. A large new wheat belt has been created in the center of the European part of the USSR—in a region which was formerly included in the so-called “consuming zone” and which today has its own grain—the Moscow, Leningrad, Yaroslavl and other regions. From 1928-1937 the area under wheat in this, as compared with what it was before, new northern region increased sevenfold. The northward movement of wheat is shown on map 11 (page 55). Wheat has also moved far to the east. In 1913 the output of wheat amounted to 45½ billion pounds and in 1937 to 98 billion pounds.

Rye and oats make less demands of the temperature and soil than wheat. They are sown extensively in the USSR, both in the black soil and non-black soil zones. Barley ripens earlier than other grains and therefore can be cultivated further north and in the mountains, where it is used as an article of food for human beings. But the main barley-fields lie in the plains of the south—in the Ukraine and the North Caucasus, where this crop is used as fodder, and for technical purposes. For its area under rye, oats, and barley, the USSR now takes first place in the world.

Millet is grown very largely in the drought districts—the Volga, Tambov, and Voronezh Regions, Kazakhstan, and other sections. Maize is grown in the Ukraine, in the North Caucasus, and in the Transcaucasus.

Until recent years rice was grown solely in Central Asia and the Transcaucasus. Now its geographical transference has begun, and rice is being cultivated in regions far to the north of the old rice zone: in the Ukraine (on the lower reaches of the Dnieper), in the North Caucasus (on the river Kuban), and also in the Far East (around Lake Khanka).

The area under cotton in the USSR has increased from 1,729,000 acres in 1913 to 5,187,000 acres in 1937, which is threefold. Formerly,



MAP II—WHEAT-GROWING IN THE NORTH

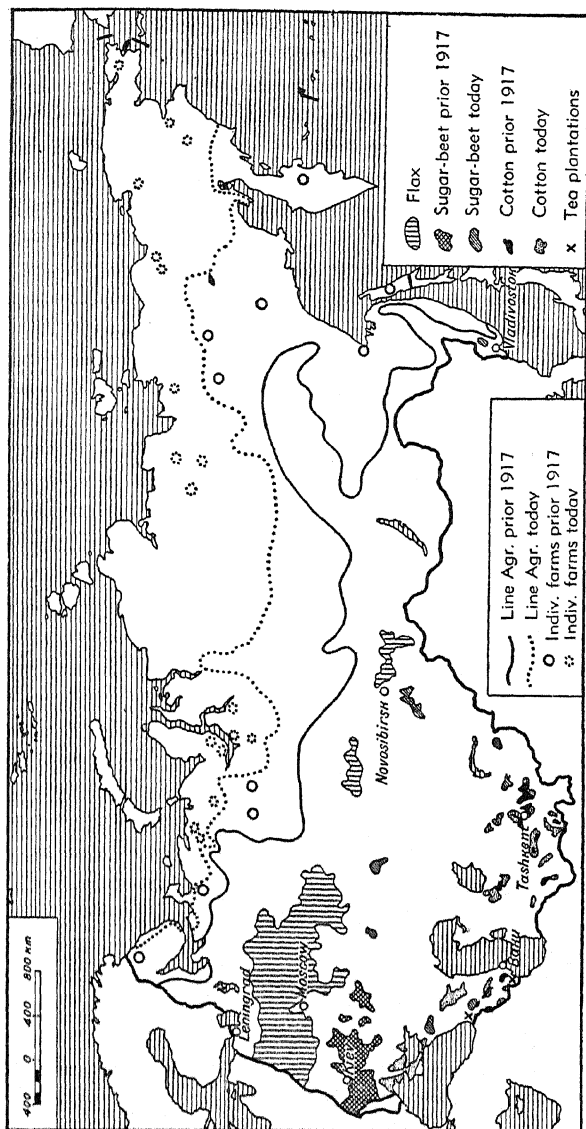
over half the cotton used in the country was imported from abroad, chiefly from the United States. Today the USSR possesses an adequate supply of its own cotton, particularly the long, fibrous, Egyptian variety. In 1913 the output of cotton fiber amounted to 529 million pounds, while in 1937 the output more than tripled, amounting to 1,808 million pounds. In cotton harvesting the Second Five Year Plan was completed ahead of schedule.

Before the Revolution the cotton plant grew only in the irrigated oases of Central Asia and in the Eastern Transcaucasus. Now the geographic borderline of the cotton plant in the USSR has been moved to the north: from 43° to 47° N. New unirrigated cotton plantations have sprung up in the Ukraine, in the steppe district of the Crimea, in the North Caucasus, and in other places. See map 9 (page 45). The proportion of these new regions in relation to the total area under cotton has grown within the space of a few years from zero to 25% (in 1937).

The USSR has the largest area in the world under sugar beet cultivation: 1,482,000 acres in 1913, 2,965,000 acres in 1937. Formerly the land under sugar beet was confined within the borders of the Ukraine and the Kursk Region. Today, while these regions remain the principal sugar beet producers, new sugar beet regions have been created in the south and east of the country: in the North Caucasus, in the Transcaucasus, in the Volga Region, in Central Asia, in Western Siberia, and in the Far East. These regions, which in the past depended entirely on the Ukraine for their sugar, now possess their own sugar industry. In 1937 the area under sugar beet in the new regions was 148,200 acres (See map 12, page 57).

The USSR has also the largest area in the world under long-fibred flax, from which linen is manufactured, having increased the area from 2,470,000 acres in 1913 to 5,187,000 acres in 1937. Long-fibred flax is sown chiefly in the northwest—in the Kalinin, Smolensk, Leningrad, Yaroslavl, and other regions, and also in Western Siberia. (See Map 12, page 57.)

The area under sunflowers has greatly increased: from 2,470,000 acres to 8,151,000 acres. The chief sunflower growing regions are the North Caucasus (along the river Kuban), East Ukraine, the



MAP 12—TECHNICAL CROPS

Voronezh Region, and the Volga Region. Within recent years sunflower cultivation has moved far to the east: to the Southern Urals, Kazakhstan, and Western Siberia.

Potatoes (7,657,000 acres in 1913 and 16,796,000 acres in 1937) are grown mainly in the northwest and the central regions. Summer planting of potatoes, which has been introduced for the first time, has permitted the cultivation of this vegetable to be moved to the south of the USSR—in particular to the southern Ukraine, which was formerly most unfavorable. For the area of land under potatoes the USSR occupies first place in the world.

New industry in the USSR required new plants: fibrous, rubber, and oil plants. The demand for vegetables and sub-tropical fruits has grown, and this led to the introduction and intensive cultivation of the cereals, vegetables, and fruits of America, Africa, Australia, and Asia. A search began for wild but valuable plants to be found in the mountains of the Caucasus and Siberia, and in the deserts of Central Asia. As a result the agriculture of the USSR has been enriched by the introduction of large numbers of new and extremely varied plants. Now cultivated on a large industrial scale, are for instance: soy bean—a Manchurian plant (in the Ukraine, North Caucasus, and the Far East); sorghum—a plant from Palestine (in the Volga Region and Kazakhstan); the Kazanlyk rose—a native of Bulgaria (in the Crimea); guaiula—a Mexican rubber-plant (in Central Asia), and many others. Kok-zaghiz, a wild rubber-plant, was discovered in 1931 in the mountains of Tien-Shan and at that time its area of distribution did not exceed 4,940 acres. Today kok-zaghiz is cultivated by the State farms of the "Caoutchouconoss" Trust and by the collective farms over an area of more than 12,350 acres, and its "natural area of distribution" has been extended to the drained marshes of Byelorussia.

Russia used to import sub-tropical raw material to the sum of 200 million rubles a year while its own sub-tropical regions remained uncultivated. Now in the USSR, particularly on the Black Sea coast of the Caucasus, cultivation is proceeding on an ever-increasing scale of tea, citrus fruits, the tung, eucomia, essential-oil bearing plants, rami (Chinese hemp), and other plants which have freed

the country from its dependence on other countries for its raw material.

Soviet scientists have cultivated many new species of plants which have helped to effect the transformation of the geography of agriculture: drought-resisting kinds of wheat, cotton plants more capable of resisting the cold, and others. They succeeded in obtaining a perennial stable wheat by crossing ordinary wheat with quitch. Of incalculable importance in the movement of agriculture far to the north and in the increase of harvest yields was vernalization—the treatment of seeds before sowing by means of definite temperatures and light. It is an agro-technical process based on the theory evolved by Soviet scientists (by Academician T. D. Lysenko) on the phasic development of plants.

The geography of horticulture has changed also. The frosty winters in the Urals and Siberia did not permit the growing of fruit trees there. The celebrated Russian horticulturist Michurin and his followers evolved hundreds of kinds of fruits capable of resisting the cold. Southern fruits were grafted with the endurance of the wild fruits of the taiga. As a result there are kinds of apples and pears which survive the frosty winter of the Urals and Siberia. Cultivated grapes and plums grow in the Far East. Peaches are shifting from Central Asia to the Ukraine; the mulberry tree to Bashkiria (to the west of the Urals).

The work of the regeneration of plant life in the USSR is being conducted on a vast scale. It was undertaken on the suggestion of Lenin who became acquainted with similar work done in the United States.*

* * *

Much damage was done to cattle-breeding in the USSR during the period of reorganization of agriculture, when the slaughter of cattle was one of the forms of resistance to the policy of collectivization, practised by the kulaks. At the end of the period of reorganization, cattle-breeding entered upon the path of development. Within four years—from the beginning of 1934 to the beginning of 1938—

* Upon Lenin's instructions one of William S. Harwood's books was translated and published in the USSR.

the number of horses increased by 5% (for the number of its horses the USSR takes first place in the world), of long-horned cattle by 52%, of sheep and goats by 82%, of pigs by 123%. This increase continues, and the quality of the animals is also improving, although not yet sufficiently. Cross-breeding of cattle is being extensively practised and for this purpose a large number of male animals of good breed have been imported from abroad. Thanks to the aid of the Government, there are now no collective farm peasants without their own cow.

TRANSPORT

The economic development of the USSR laid a heavy burden on the railways. Freight turnover rose from 41 billion ton-miles in 1913 to 229 billion ton-miles in 1938, i.e. by 560%. The length of the railways increased in a considerably lower proportion: from 36,350 miles in 1913 to 53,000 miles in 1937. This means that the planned method of economic administration permitted a more rational utilization of the existing network, and also that more powerful locomotives and larger passenger and freight cars run on them. The roadbed has been improved, automatic coupling, as well as automatic brakes and blocking, have been introduced. A dispatchers' institute has been opened. In the reconstruction of transport much has been borrowed from the experience of the U.S.A. In the USSR, locomotives working on condensed steam have been introduced which run a distance of 620 miles without stopping for water and effect a 20% economy in fuel. In the Ukraine, in the Urals, near Moscow and Leningrad, in the Caucasus, in Kuzbas (Western Siberia), and on the Kola Peninsula (the north of the European part of the USSR), approximately 1,250 miles of railway have been electrified.

Until 1935 the railways of the USSR did not entirely cope with their work, but after the whole system had been reorganized, they completely overcame their defects, fulfilling the Second Five Year Plan for transport in four years and becoming one of the leading branches of national economy.

In 1913 the freight transport of the railways of Russia was equal to 13.5% of that of the United States, while in 1936 it was equal to

63.4%. In the USSR by the end of the Second Five Year Plan period the annual load carried per kilometer was 4,200,000 metric tons, whereas in the U.S.A. it was only 1,900,000 tons. It follows, therefore, that the railways in the USSR are utilized more intensively.

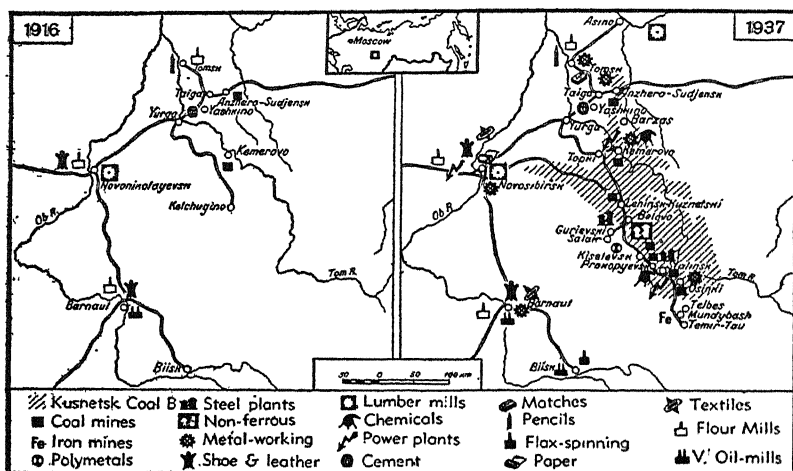
The more developed western plains of the USSR are much better provided with railways than the rest of the country. But new railway construction is beginning to rectify the former unevenness of the railway network: thus, of the railways constructed during the First Five Year Plan period, 80% were laid in the east. For example, there is the "Turksib" (896 miles) from Siberia to Central Asia; a branch from the Siberian main line south to the Karaganda coal basin and the copper plant on Lake Balkhash (751 miles); another from the town of Termez to the capital of the Tajik SSR—Stalinabad (140 miles), and several others. The single-track section of the Trans-Siberian line (in the Far East), has been converted into a double-track line over a distance of nearly 1,865 miles. New railways are under construction in the European part of the USSR as well: a line connecting Moscow and the Donbas (673 miles), which is nearing completion; a connection between the Donbas and Leningrad, which has been increased, and so on. A second Trans-Siberian Railway is being constructed in sections.

The shifting of productive forces to the east and the rapid development of the eastern regions have resulted in the increase of freight turnover in the east at a higher rate than in the west. The creation, for example, of the Ural-Kuznetsk Combine gave rise to a dense flow of coal and iron ore moving in either direction across the whole of Western Siberia.

Map 13 (page 62) vividly demonstrates how a new and powerful industrial region has arisen in the formerly backward East of the USSR.

In tsarist Russia the competition of the railways hindered the development of river transport and the close network of rivers in the land was comparatively little utilized. But in 1936 the river vessels of the People's Commissariat for Water Transport carried 70,000,000 tons of freight, nearly four times as much as at the beginning of the First Five Year Plan. The total length of waterways

utilized in 1937 amounted to 62,760 miles. Many rivers have been made navigable for the first time, particularly the rivers of the Siberian North: the Piassina, Yana, Indigirka, Kolyma, and others. Great canals have been cut: the Stalin White Sea-Baltic canal (142 miles), and the Moscow-Volga Canal (80 miles). The freight turn-over of sea transport has also increased (three and a half times within the years 1929-1938). New ports have come into existence, such as Igarka on the lower Yenissei, Byelomorsk on the White



MAP 13—LOCATION OF INDUSTRIES IN THE KUZBAS REGION

Sea, Nogayevo on the Sea of Okhotsk, and others. The North Sea Passage, connecting the east and west of the country via the Arctic Ocean, has been established. An automobile transportation system has been created, over great motor roads laid from Osh right through the Pamirs to Khorog (469 miles); from Bolshoi Niever Station on the Amur railroad, to the north into the interior of Yakutia (about 620 miles); from Nogayevo on the Sea of Okhotsk to the upper reaches of the Kolyma (several hundred miles); and to many other sections.

The USSR is a land of immense distances, to a far greater degree than even the U.S.A. These distances are overcome by speed. That

is why civil aviation, created in recent years for the first time, is of such great importance in the USSR. The length of air lines in 1937 totalled 81,200 miles. Within the period 1933-1938 the freight turnover of civil aviation increased tenfold.

Regular air lines cross the whole country—from Kiev to Vladivostok, from Leningrad to Tbilisi, from Moscow to Tashkent. (See Map 14, page 64.) The borderlands are interconnected and joined with the center by air lines. The following example will illustrate the scale of work accomplished by aviation: the transport of freight and mail by airplanes in the Transcaucasus, Central Asia, and Kazakhstan, exceeds the air transport of Germany, France, and England taken together. The Soviet Union holds thirty-five international flying records (1938).

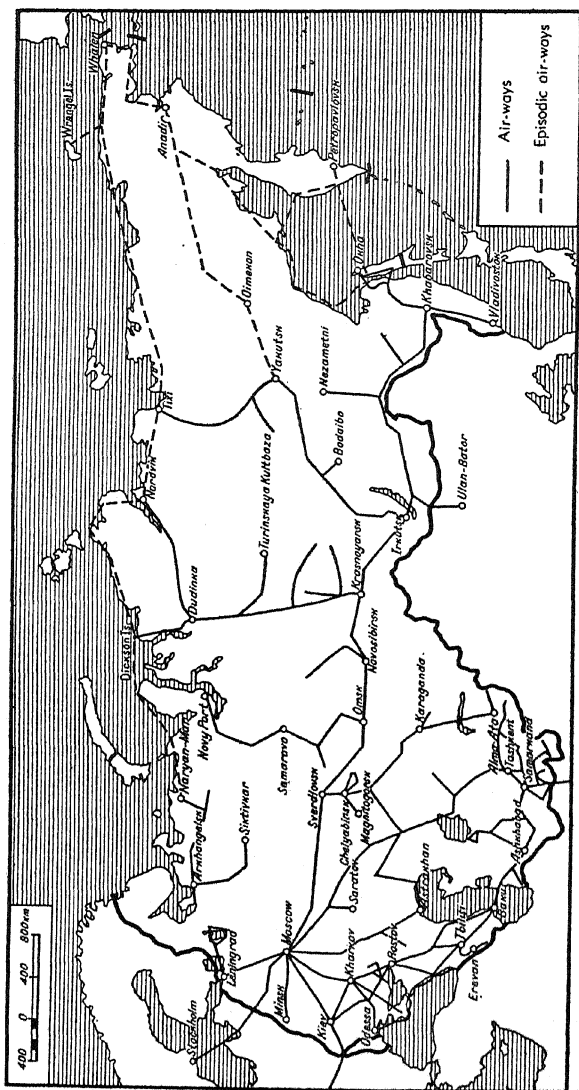
Of particular importance is the role of Soviet aviation in the Arctic Regions. Airplanes, overcoming fog, blizzards, frosts, and scant visibility, carry passengers, mail, and freight; search for the colonies of marine animals; supply those in winter colonies and scientific stations with provisions; and guide ships through the ice. In 1937 a squadron of Soviet flying-boats landed on the ice near the North Pole and left there a scientific party composed of four intrepid Arctic explorers headed by Papanin.

The Soviet airmen, Chkalov and Gromov, connected the Soviet Union and the United States of America by the shortest route—over the North Pole.

FOREIGN TRADE

The economic relations between the USSR and other countries are based on the *monopoly of foreign trade*: under this monopoly the right of conducting all trading operations belongs exclusively to the Soviet Government which exercises this right through the People's Commissariat for Foreign Trade. The State monopoly of foreign trade is one of the most basic factors of the planned economy of the USSR.

Pre-revolutionary Russia depended for a large number of most essential commodities on imports. During the period of the First Five Year Plan, when heavy industry was being built up at a rapid pace, the imports of the USSR were very high: the country im-



ported a large amount of machinery and equipment (45% of the total imports), and also metals. But later, after the country had created its own heavy industry, there was a drop in imports. The USSR had itself begun to manufacture motorcars, agricultural machinery, various kinds of lathes, etc., which it had previously imported. The development of agriculture freed the country of its dependence on foreign-grown cotton, etc. During the period of the First Five Year Plan the USSR had an adverse foreign trade balance of \$465,000,000, while during the period of the Second Five Year Plan the foreign trade balance was in favor of the USSR and amounted to \$455,300,000.

The Soviet Union is now able to satisfy its main needs without imports. At the present time orders are placed abroad chiefly for specimens of different machines of new design for the purpose of acquainting Soviet industry with the latest achievements of foreign engineering. In 1928 the proportion of imported machine equipment in relation to the corresponding home production was equivalent to 43%, while in 1937-38 it fell to 0.94%. The USSR still continues to import a certain amount of raw material and half-finished products in order to accelerate the rate of certain branches of socialist construction. The proportion of the cost of imported goods to the total value of all the goods consumed in the USSR is 1%, as against 8-9% in the United States, 40-50% in England, 20-25% in Germany, etc.

The exports of the USSR have also undergone an important structural change as a result of the industrialization of the country. Seventy-one per cent of the exports of tsarist Russia consisted of agricultural products (the average figure for 1909-1913). Within recent years 70-85% of the exports of the USSR consist of industrial goods. Much of what the country used to import in the past is now exported by her. For example, to the previous items of export—lumber, oil products, and pelts—there have now been added coal, pig-iron, phosphorus and potassium fertilizers, tractors, automobiles, electrical equipment, and other articles—all of which used to be imported in tsarist days.

The fact that the Soviet Union has attained technical and economic independence by no means signifies the isolation of this

country from the rest of the world. The change is only in the character of the economic relations of the USSR with other lands and in the structure of export and import.

In regard to the foreign policy of the Soviet Union, Stalin said at the XVIII Congress of the Communist Party in 1939: "We stand for peace and the strengthening of business-like relations with all countries. That is our position; and we shall adhere to this position as long as these countries maintain identical relations with the Soviet Union, and as long as they make no attempt to violate our country's interests."

WORK

Together with the developed national economy, industrial workers have arisen in the USSR who successfully master new technical methods.

The development of socialist rivalry and of its highest form—the Stakhanov movement—a movement of workers and collective farmers who have learned to apply new technical methods and exceed former industrial standards by many hundred per cent—has led to a great increase in the productivity of labor in industry, agriculture, and transport. The Stakhanov movement is named for the Donbas miner Alexis Stakhanov, who on August 31, 1935 hewed 102 tons of coal in one shift, thus exceeding the standard amount fourteen-fold. Subsequently other Stakhanovites exceeded Stakhanov's result by several hundred per cent.

The productivity of labor in the USSR increased during the years of the First and Second Five Year Plans by an average of 12%, and in heavy industry by 17% (the average annual increase in labor productivity in the United States was equivalent to 3-4% within the years 1920-1930).

In its rate of growth of the productivity of labor the USSR has far surpassed the leading capitalist countries. In the level of labor productivity, the USSR now occupies one of the first places in Europe, but still lags considerably behind the U.S.A. However, the productivity of labor in blast-furnace production at a number of new metallurgical works of the USSR in 1937 exceeded the average productivity of labor in metallurgy in the United States. A high

coefficient of the utilization of the blast furnaces has been attained at several plants. For example at the new metallurgical works in the Kuzbas (Western Siberia) where in blast furnace No. 2, a coefficient of efficiency of 0.78 was reached, this being a record coefficient as compared with the best metallurgical works in America. In one southern group of metallurgical works in the USSR there are over thirty thousand Stakhanovites who beat the records of American works. But, on the whole, the output per man in metallurgy in the USSR is as yet considerably lower than in the United States, though higher than in Germany and England.

The increase of labor productivity in the USSR has been accompanied by an increase in wages. The average annual wages of workers and employees engaged in every branch of national economy rose 113.5% in 1937 as compared with 1932. In 1937 alone the wages of the workers increased by 10,500 million rubles.

State expenditure on cultural and other indispensable services for the industrial, office and professional workers increased within the Second Five Year Plan from 4,400 million rubles to 14 billion rubles, i.e. more than threefold. What the workers in the USSR spend out of their own pockets on cultural and educational matters is only one-tenth of the total expenditure for these purposes: nine-tenths of this sum is met by the State and the trade unions.

There was a considerable rise in the standard of living of the collective farmers during the years of the Second Five Year Plan. The gross income of collective farmers increased over 2.7 times during the period 1933-1937, while the income in money divided among the collective farmers in accordance with the number of work days to their credit increased during the same period four-and-a-half times.

People became more prosperous and trade turnover increased accordingly. During the years of the Second Five Year Plan, State and cooperative trade turnover increased more than threefold, and together with collective-farm trade it rose from 47,800 million rubles in 1932 to 143,700 million rubles in 1937. In 1938 the turnover of retail trade had increased by nearly 10% as compared with 1937.

All this led to an increase in personal consumption and to a rise

of the cultural level of the people, for socialism means not only a growth of industry but also a growth of consumption.

Questions relating to culture and the everyday life of the nation are beyond the scope of this book. We shall confine ourselves to a few examples.

During the period 1932-1936 the consumption per head of clothing, underclothing, and footwear by industrial, office and professional workers increased by 90%, and of perfumery and cosmetics by 270%. In 1937 the consumption of butter increased nearly two-and-a-half times as compared with 1932; of pork—three-and-a-half times; of sausages of various kinds, nearly fourfold; of wheat bread, nearly threefold; of fruit, nearly fourfold. The worker in the USSR spends 4.3% of his money on rent as compared with 20% before the Revolution. In 1937, five times as many gramophones were sold in the Soviet Union as in 1935, seven times as many gramophone records, twice as many cameras, two-and-a-half times as many bicycles. When, in 1936, the Moscow Stanislavsky Theatre went on a two months' tour to the Stalingrad Tractor Works (Lower Volga), the workers spent a total of nearly half a million rubles on theatre tickets. During the period of the Second Five Year Plan the average sum of money kept in the savings banks increased eightfold.

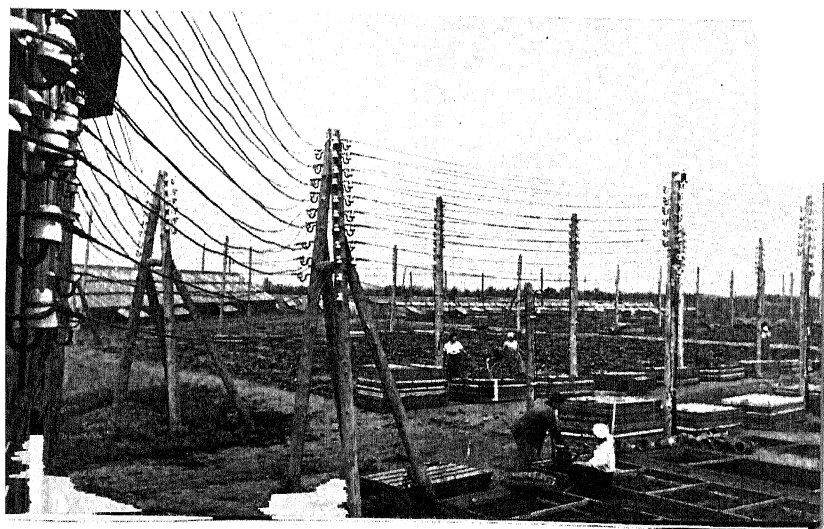
In 1932 each collective farm household received 1,320 lbs. of grain per work day: in 1937 this amount had increased to 3,850 lbs. There were millions of collective-farm households receiving from 17,000 to 55,000 lbs. of grain a year in the grain-growing regions, and incomes of tens of thousands of rubles in the regions of technical [or industrial] crops. In 1937 the consumption per head of sugar in the rural districts had increased nearly six-and-a-half times as compared with 1933, of confectionery over threefold; the collective farmers bought double the amount of cotton fabrics, leather boots and shoes, and rubber galoshes and overshoes and nearly four times as much toilet and kitchen soap. Up to 80% of his income the collective farmer, who does not have to purchase or rent land or agricultural machinery, spends on manufactured goods, agricultural produce, and so on. (Before the Revolution the poorest peasants could only spend 8-9% on clothes and footwear.)

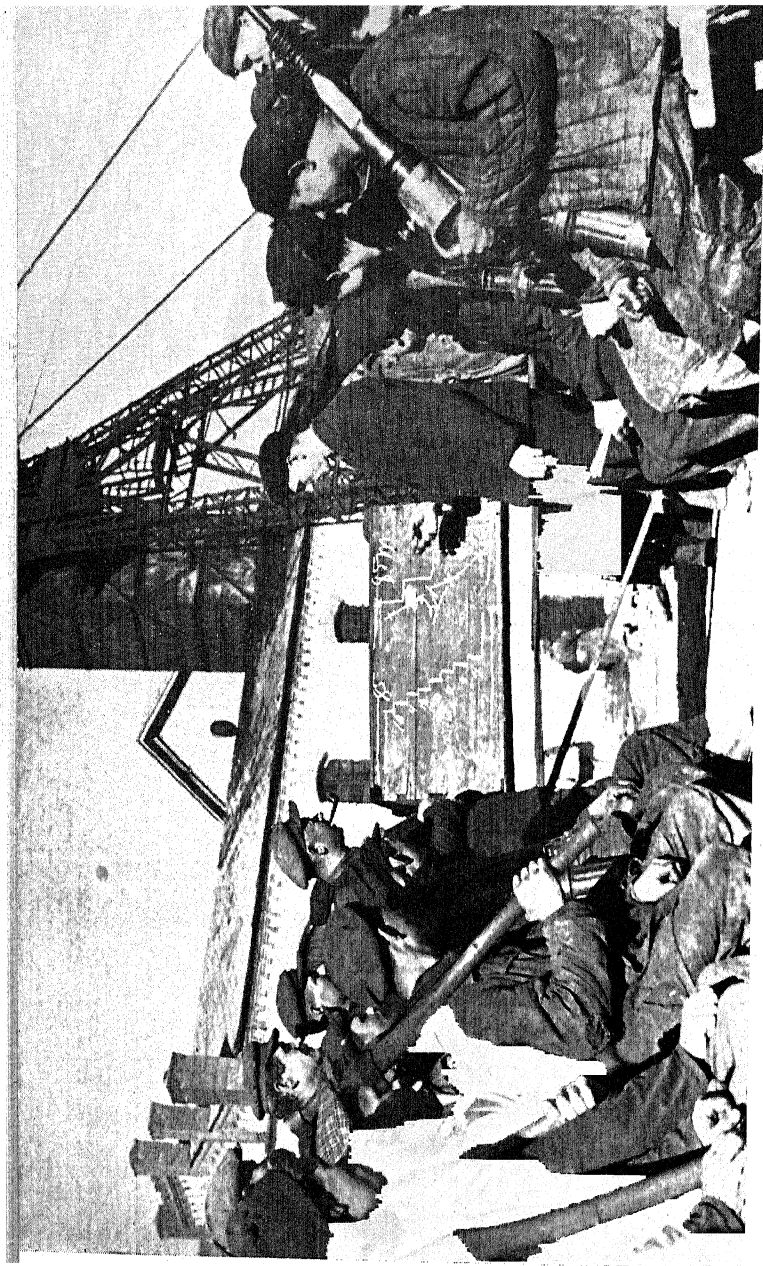
Already by 1934, there were for every 100 collective farm house-



Workers setting out for the fields on a collective farm

Hothouse cultivation of vegetables on a collective farm





Alexei Stakhanov explaining his work methods to fellow-miners

holds on the average 7,241 books; before the Revolution the overwhelming mass of the peasants were illiterate and did not read books. In 1936, 54% of the collective farmers went to plays and motion pictures three times a month. These recreations were unknown in the village of tsarist Russia.

THE RISE IN THE CULTURAL LEVEL OF THE PEOPLE OF THE USSR

<i>Item</i>	<i>Unit of measurement</i>	<i>1933-34</i>	<i>1938-39</i>	<i>1938-39 in percent- ages of 1933-34</i>
Number of pupils and students in schools of all grades	in thousands	23,814	33,965.4	142.6
Number receiving elementary education	"	17,873.5	21,288.4	119.1
Secondary education (general and special)	"	5,482.2	12,076.0	220.3
Higher education	"	458.3	601.0	131.1
Number engaged in study in USSR (including all forms of study)	"	47,442.1
Number of public libraries	"	40.3	70.0	173.7
Number of books therein	in millions	86.0	126.6	147.2
Number of club premises	in thousands	61.1	95.6	156.5
Number of theaters	units	587	790	134.6
Number of cinema installations (excluding apparatus for narrow film)	"	27,467	30,461	110.9
Number with sound apparatus ...	"	498	15,202	31 times
Number of cinema installations (excluding apparatus for narrow film) in the villages	"	17,470	18,991	108.7
Number with sound apparatus ...	"	24	6,670	278 times
Annual newspaper circulation	in millions	4,984.6	7,092.4	142.3

A real cultural revolution took place in the USSR during the Second Five Year Plan period.

Before 1917 only 25% of the population was able to read and write: now over 90% are literate. During the years 1933-1938, 20,607 schools were built. In 1914 the elementary and secondary schools were attended by eight million children: today they are attended by more than 30 million, of whom 20 million are in the rural schools. The number of libraries as compared with the pre-revolutionary

times has increased fivefold. In 1914 there were 153 professional theatres: in 1938 there were 790 performing in more than forty languages of the peoples of the USSR. The circulation of newspapers in 1936 was 37,971,000 copies. They are published in sixty-nine languages. The total number of books published in 1937 amounted to 673,500,000 copies. Over thirty million copies of the Constitution of the USSR have been published. Books are being printed for the first time in the Adighey, Bashkirian, Buriat-Mongolian, Kalmyk, Kara-Kalpak, Karachay, Kirghizian, Komi-Zirian, Moldavian, Mordvinian, Tajik, Turkmenian, Circassian, Chechen, and other languages—in 111 languages of the peoples of the USSR. Today there is hardly a family in the USSR whose children have not received a secondary education. The number of manual workers, office employees, and peasant families whose children are receiving a higher education is increasing steadily.

There were 91 universities and other higher educational establishments in the country in 1914: in 1936 there were 700. On the territory of the Byelorussian, Azerbaijan, Armenian, Uzbekistan, Turkmenian, Tajikistan, Kazakhstan, and Kirghizian Union Republics there had never been a university at all before the Revolution. Today there are universities in each of these republics—nearly one hundred in all. There are 75 books in the libraries of the USSR for every one hundred inhabitants—more than three times as many as were in Germany in 1934. The total number of students in institutions of higher education in the whole of the Soviet Union is 601,000—more than in France, Germany, Italy, Japan, and England taken together.

THE THIRD FIVE YEAR PLAN

As a result of the successful fulfillment in the USSR of the Second Five Year Plan, the objectives of this plan have been achieved: the exploiting classes have been permanently abolished, the technical reconstruction of national economy has in the main been accomplished, and the level of national consumption more than doubled within the Second Five Year Plan period. The principle of Socialism has been put into practice: *"From each according to his abilities, to each according to his work."* The USSR has now entered

the phase of the completion of the building of socialist society and the gradual transition to communist society, in which the main basis of public life must be the principle of Communism: *"From each according to his abilities, to each according to his need."*

In spite of the successful fulfillment of the First and Second Five Year Plans, in spite of the record rate of development of Soviet industry, in spite of the country's attainment of the most advanced technique of production and the achievement of technical and economic independence, nevertheless the USSR has not yet overtaken economically the other more highly developed countries. Owing to the historical backwardness of the country in the past, the level of development of industry with regard to average volume of production per capita of the population, is still lower in the USSR than in the advanced countries of Europe and in the United States. In the USSR in 1937, the industrial production per capita was approximately one-third to one-fourth of that in the U.S.A. However, compared with 1928, it had increased by 497% in the USSR while in the U.S.A. it was equal to 91%. The USSR still lags behind the volume of per capita production of electric power, coal, pig-iron, textiles, paper, soap, etc.

In 1913, on the eve of the World War, the consumption per head of pig-iron in tsarist Russia was one-eleventh of that in the U.S.A. During the years of the two Five Year Plans the USSR made a great stride forward. The new equipment of the metallurgical industry is in no way inferior to that of the U.S.A. The output of pig-iron has grown from 4,200,000 metric tons to nearly 15,000,000 metric tons, *i.e.* three-and-a-half times. Now the output of pig-iron per capita of the population in the USSR is not one-eleventh, but one-third, of that of the U.S.A. Still it is only one-third.

In order to overtake the United States economically in this respect, taking as its standard not the level of the crisis year of 1938, when the United States produced only 18,800,000 metric tons of pig-iron, but the level of 1929, when there was an industrial boom and nearly 43,000,000 metric tons of pig-iron were produced, the USSR must augment its annual output of pig-iron to 50 or 60 million metric tons.

The task is to overcome the inequality in industrial production

per capita in comparison with the technically and economically most highly developed countries of the world.

In the words of Stalin: "We have outstripped the principal capitalist countries as regards technique of production and rate of industrial development. That is very good, but it is not enough. We must outstrip them economically as well. We can do it, and we must do it. Only if we outstrip the principal capitalist countries economically can we expect that our country will be fully saturated with articles of consumption, that we will have abundance of products and will be able to effect the transition from the first phase of Communism to its second phase."

Molotov, the head of the Soviet Government, said: "People here and there forgot that economically, that is, from the point of view of the volume of industrial output per capita of the population, we are still behind some capitalist countries. They forgot that, properly speaking, it is only a matter of 10 or 12 years since we have been able to begin to raise our country from its former low level of development. They forgot that it is a question of putting an end to this lag behind other countries, which is the result of more than a century of backwardness on the part of pre-revolutionary Russia. This must on no account be forgotten, nor can we on any account rest content with our achievements.

"Socialism has been built in the USSR, but only in the main. We have still a very great deal to do before the USSR is properly supplied with all that is necessary, before we produce sufficient quantities of all goods, before we have an abundance of all products, before we raise our country economically as well as technically to a level not only as high as that of the foremost capitalist countries, but considerably higher.

"We have entered a new phase of development, the phase of the gradual transition from Socialism to Communism. But this transition to Communism means an abundance of all products, and we are still far from that. This transition to Communism means reaching such a high technical and economic level of the country as to surpass considerably the present level of all the economically highly developed capitalist countries. Hence it follows that we are faced

with new tasks, tasks of tremendous importance in the economic development of the USSR."

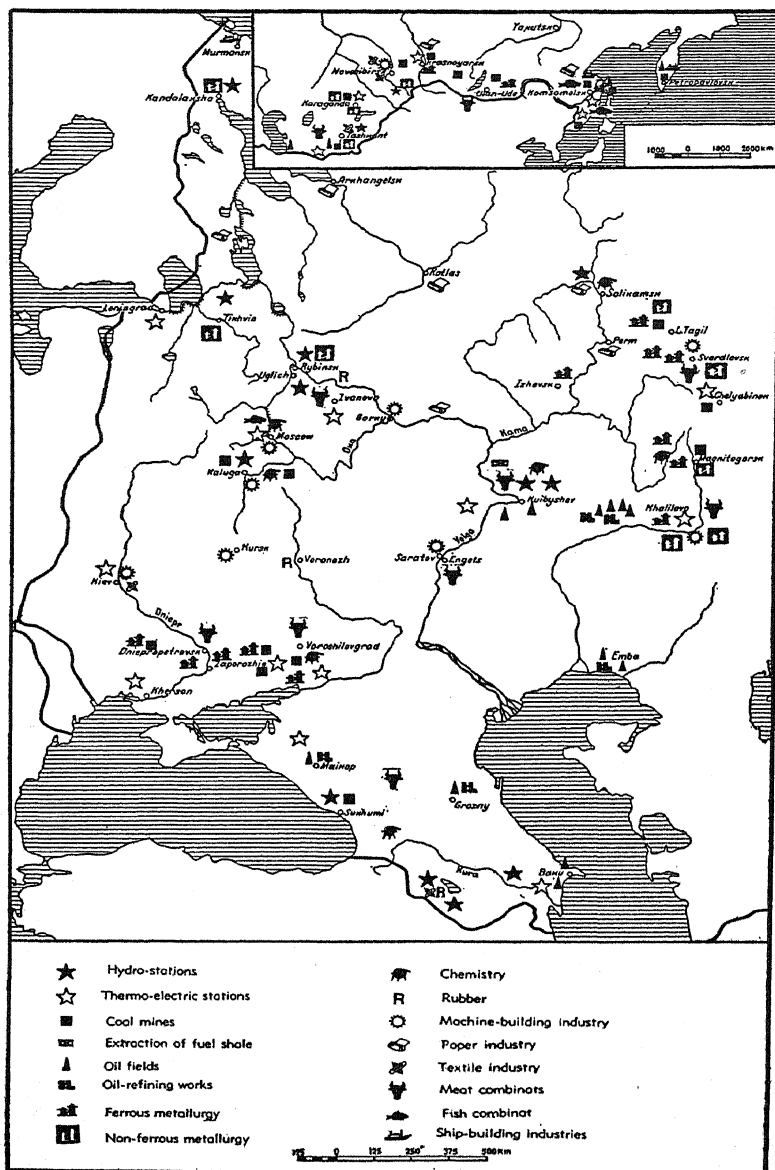
Thus the USSR has been brought face to face with this task of overtaking and surpassing within a short space of time—in the course of two or three Five Year Plan Periods—the most highly developed capitalist countries of Europe and the United States on an economic scale. It has been proposed that a peaceful economic competition be inaugurated between the USSR and the most important capitalist countries. In the years 1938 to 1942, the Third Five Year Plan is to be completed, and the fulfillment of this Plan will to a great extent determine in advance the final achievement of this task.

The Third Five Year Plan will be a five year period of further swift development. This is the pace that has been set. The First Five Year Plan in the USSR was fulfilled before schedule (within four years), and industrial output was doubled (to be more exact, it was increased by 102%). The Second Five Year Plan provided to further increase industrial output by 110%; it was fulfilled as a whole before schedule and increased to 121%. Then began the period of the Third Five Year Plan, which once again provides for a doubling of industrial output (an increase of 90%, to be more exact). Thrice in succession the output will have been doubled. This means that the increase of industrial output within the period of the Third Five Year Plan must be considerably greater than the increase of output within the period of the First and Second Five Year Plans taken together.

The volume of industrial output of the whole of industry (in 1926/27 prices) must be equivalent in 1942, the last year of the Third Five Year Plan, to 184,000 million rubles against 95,500 million rubles in 1937, the last year of the Second Five Year Plan: the planned increase is therefore 92%.

The average annual growth of industry must be equivalent to 14%, and of the production of the means of production to 15.7%. Such rates are unknown in other countries.

Machine construction by the end of the Third Five Year Plan must increase by 129%, which means it must grow much more rapidly than industry as a whole. The plan provides for the intro-



MAP 15—SOME OF THE MOST IMPORTANT CONSTRUCTIONS DURING THE THIRD FIVE YEAR PLAN PERIOD

duction of up-to-date technique in every branch of national economy and every form of defense. Within the period of the Third Five Year Plan the USSR must outstrip all the countries of Europe in per capita output of machinery.

Sea and ocean transport must be provided with every kind of modern vessel. Automobile output will increase by 100%. During the Third Five Year Plan the USSR will be second only to the United States in number of freight cars.

The output of coal must increase by 90%, the output of oil by 77%, the production of pig-iron by 52%; there will be a sharp increase in the output of special steels. The output of the chemical industry will increase by 137%—more than the industry as a whole.

The output of electric power will be more than doubled (a 106% increase). Within the period of the Third Five Year Plan it is planned to put into operation six times as much electric power as was designed to be put into operation within ten to fifteen years by the GOELRO plan, drafted in 1920.

Immense State reserves of fuel, electric power, etc., will be created.

The productivity of labor in industry will increase by 65% during the Third Five Year Plan period. For productivity of labor the USSR will outstrip the advanced countries of Europe.

Agricultural produce must increase by 52%. The complex mechanization of agricultural labor will be completed.

Railway freight turnover will increase from 223 billion ton-miles in 1937 to 317 billion ton-miles in 1942. Eleven hundred forty-three miles of railway track will be electrified; 6835 miles of new railway lines will be laid.

In the course of the Third Five Year Plan for water transport, the Astrakhan-Gorky-Ribinsk-Moscow waterway will be so reconstructed that by the end of the Third Five Year Plan there will be a deep transit route from the mouth of the Volga to Moscow with a depth of no less than 8½ feet at any point.

Motor traffic will increase 4.6 times, and 130,200 miles of roadway will be laid and reconstructed.

During the Third Five Year Plan period more productive forces will be put into operation than during the period of the First and Second Five Year Plans taken together. Work has begun on the

mightiest construction in the world: the Kuibyshev hydro-junction on the Volga having a total capacity of 3,400,000 kilowatts.

Complex development of economy must be effected in the principal economic regions of the USSR. The shifting of productive forces to the East will continue. The construction of moderately large and small enterprises in every branch of national economy will be undertaken with a view to accelerating construction and putting productive forces into operation, and for the purpose of distributing new enterprises over the principal economic sections of the country.

Extensive measures will be taken to make increasing progress towards raising the cultural and technical level of the working-class to the level of the engineers and technical experts. Universal secondary education will be introduced in the towns. The number of elementary and secondary school-children will be increased from 29,400,000 in 1937 to 40,100,000 in 1942.

The number of students in the universities will be raised to 650,000; within the next few years attention will be paid chiefly to improving the quality of higher education. Within five years 1,400,000 students will graduate from various technical schools, and 600,000 will graduate from the universities. By the end of the Five Year Plan period every third citizen of the USSR will be studying somewhere.

The Third Five Year Plan will signify the rapid growth, not only of industrial, but also of personal consumption—the rapid growth in the prosperity of the masses. The output of articles of common use will increase by 70%. The consumption of the working people will increase by over 50% in accordance with the increased incomes of the workers, peasants, and office employees. The Third Five Year Plan aims to increase average wages by 35%, to increase considerably the incomes of the collective farmers, and to provide the population with 376,600,000 sq. feet of new housing. The national income will increase by 80%.

Such, in broad outline, is the peaceful program of economic and cultural construction in the USSR for the period of the Third Five Year Plan.

The Russian Soviet Federated Socialist Republic

FIRST AMONG EQUALS

THE USSR consists of eleven equal and voluntarily united Soviet Socialist Republics. The leading position is held by the Russian Soviet Federated Socialist Republic (the RSFSR). To it belongs the whole northern and central belt of the Soviet Union, from the western frontier to the Pacific Ocean. Included in the RSFSR are the whole of the tundra zone, nearly the whole of the forest zone, and part of the steppe and forest steppe zones. The extreme south of the RSFSR (on the Black Sea coast) lies in the humid subtropical zone. The RSFSR is first among the Union republics both for its territory (6,375,000 square miles; 78% of the territory of the USSR) and for the size of its population (somewhat more than 100 million people; more than 60% of the population of the USSR).

The RSFSR is first among the Union republics in its economic strength. It produces 70% of the industrial output of the whole of the Soviet Union, accounting for 77% of the machinery, about 70% of the tractors, about 60% of the harvest combines, 90% of the textiles, 90% of the timber, over 40% of the coal, 20% of the petroleum, about 40% of the pig-iron, 100% of the nickel, and 65% of the electric power. Within its territory are such important industrial regions as the Old Industrial Center, Leningrad, the Urals, and the Kuznetsk Coal Basin (Kuzbas), as well as 70% of the land under grain and about 60% of that under technical crops (80% of the flax and about 70% of the hemp).

The economy of the RSFSR, as of the whole of the USSR, is developing rapidly. The industrial output had increased from 7,900

million rubles in 1913 to 66,400 million rubles, *i.e.*, 8.4 times, in 1937, the last year of the Second Five Year Plan. Within the same period the output of coal increased 8.6 times, of light industry 5.7 times, the amount of electric power generated increased twenty-fold, the output of machine building twenty-ninefold. The amount of freight carried by the railways increased more than fourfold.

As it is the strongest of the Union republics, the RSFSR extends valuable aid to the other republics of the USSR, passing on to them its political experience, its culture, and its skilled workers. The most complicated machinery, motor-cars, various metals, timber, textiles, etc., are sent from the RSFSR to the other Union republics. In turn, it gets from them a number of necessary products. The economy of the RSFSR is inseparably bound up with the entire economy of the USSR. All eleven Union republics are most closely linked both by the unified transportation system and by long established geographical divisions of labor.

Occupying as it does such a huge area, the RSFSR is remarkable not only for its variety of natural conditions but for the wealth of its deposits as well. For example, it has 90% of the coal deposits of the country, the greater part of the deposits of iron ore (including the famous Kursk Magnetic Anomaly), gold, nickel, potassium, and other minerals.

In addition to the Russians, scores of nations and nationalities, differing in numbers and in the economic-cultural level prevailing at the time of the October Revolution, inhabit the territory of the RSFSR: Tatars, Bashkirs, Chuvashes, Jews, Karelians, Yakuts, Circassians, Kalmyks, the Evenks (Tunguses), Luoravetlans (Chukchis), and others. The most numerous of the peoples form, within the RSFSR, Autonomous Soviet Socialist Republics (17 of them) and Autonomous Regions (6). The smaller national minorities form national regions and national districts. Russians make up 80% of the population of the RSFSR.

The territory is divided into provinces and territories. The number of units of the political-administrative division is very great. For the purposes of a survey it will be expedient to arrange them into the following twelve groups in accordance with their natural and economic features:

The Old Industrial Center, lying in the center of the European part of the RSFSR, mainly in the tract between the Rivers Oka and Volga: the Moscow, Ivanovo, Yaroslavl, Gorky, Tula, and Ryazan Regions.

The Black Soil Center, adjoining the old industrial region from the south: the Oriol, Kursk, Tambov, Voronezh, and Penza Regions.

The West of the European part of the RSFSR, lying between the center and the western frontier: the Kalinin and Smolensk Regions.

The North-West of the European part of the RSFSR, stretching from the Baltic Sea to the Barents Sea: the Leningrad Region, the Karelian Autonomous Soviet Socialist Republic, and the Murman Region.

The North-East of the European part of the RSFSR, lying between the center, the Barents Sea, and the North Urals: the Vologda, Archangel and Kirov Regions and the Komi ASSR.

The Volga Region, including the middle and lower reaches of the Volga: the Mari ASSR, the Chuvash ASSR, the Tatar ASSR, the Kuibyshev Region, the Mordovian ASSR, the Saratov Regions, the ASSR of the Volga Germans, the Stalingrad Region, and the Kalmyk ASSR.

The Lower Don and the North Caucasus lying in the south of the European part of the RSFSR mainly between the Caucasus and the Black Sea, the Sea of Azov, and the Caspian: the Rostov Region, the Krasnodar Territory with the Adighey Autonomous Region, the Orjonikidze Territory with the Karachayev and Circassian Autonomous Regions, the Kabardino-Balkarian ASSR, the North Ossetian ASSR, the Chechen-Ingush ASSR, and the Daghestan ASSR.

The Crimea, a peninsula in the Black Sea, the territory of the Crimean ASSR.

The Urals, a group of districts lying along the mountain range which separates Europe from Asia: the Perm, Sverdlovsk, Cheliabinsk, and Chkalov Regions, the Udmurt ASSR, and the Bashkirian ASSR.

Western Siberia, from the Urals to the River Yenissei: the Omsk and Novosibirsk Regions and the Altai Territory with the Oirot Autonomous Region.

Eastern Siberia, from the Yenissei to the watershed ranges lying along the coast of the Pacific Ocean: the Krasnoyarsk Territory with the Khakas Autonomous Region, the Irkutsk and Chita Regions, the Buriat-Mongolian ASSR and the Yakut ASSR.

The Soviet Far East, lying along the coast of the Pacific Ocean: the Khabarovsk Territory with the Jewish Autonomous Region, and five regions within the Territory (the Amur, Khabarovsk, Lower Amur, Sakhalin, and Kamchatka), and the Maritime Territory with two regions within the Territory (the Maritime and Ussuri). In addition, a special place is devoted to the Soviet Arctic which includes the northern parts of a large number of regions and territories included in other districts.

* * *

Many Russians live in other Union republics besides the RSFSR. Russians compose over half of the entire USSR, and the Russian nation is the senior among the fully equal Soviet peoples. It played a leading role in the Great October Socialist Revolution and in the Civil War, just as it plays a leading role in socialist construction, economic as well as cultural.

Stalin, the leader of the Party created by Lenin, and the Party which is guiding the reshaping of the whole country, described Leninism as the combination of Russian revolutionary range of action with American efficiency. He wrote: "The wide Russian revolutionary range of action is an antidote against inertness, routine, conservatism, mental stagnation and slavish submission to ancestral traditions. This wide range is the vivifying force which awakens thought, pushes forward, breaks with the past, and opens up perspectives. . . .

"American efficiency is that indomitable spirit that neither knows nor will be deterred by any obstacle, that plugs away with business-like perseverance until every impediment has been removed, that simply must go through with a job once it has been tackled even if it be of minor importance and without which serious constructive work is out of the question. . . .

"The combination of the wide Russian revolutionary range of

action with American efficiency is the quintessence of Leninism in Party and State work."

The Russian people occupy an important place in the cultural history of mankind. They gave the world such outstanding men as the writers Pushkin, Leo Tolstoy, Dostoyevsky, Chekhov and Gorky, the chemist Mendeleev, the physiologist Pavlov, the mathematician Lobachevsky, the composers Tchaikovsky and Moussorgsky, and the actor-regisseur Stanislavsky.

"In the realm of art, in the expression of the heart," wrote Maxim Gorky, "the Russian people manifested amazing force, having created under the most difficult conditions an admirable literature, marvelous painting, and original music. . . . The lips of the people were shut, the wings of its soul were bound, but its heart gave birth to numbers of great artists of the word, of sounds, and of color."

"Russia," said the well-known French journalist Marcel Sambat, "arrived later than others because she began her historical life later than others, but in the 19th century alone she has succeeded in giving Pushkin, Gogol, Tolstoy, and Dostoyevsky—four artistic titans of the 19th century. What may we not expect of her in the future?"

At the basis of Russian culture lies the remarkably rich and forceful Russian language. Engels, the colleague of Karl Marx, said: "How beautiful the Russian language is: all the advantages of German without its terrible coarseness." Lomonossov, the founder of Russian science and a peasant by birth, who discovered the law of conservation of energy seventeen years before Lavoisier, wrote of the Russian language as follows: "The Roman Emperor Charles V used to say that the Spanish language is suitable for conversation with God, the French language for one's friends, the German language for one's enemies, and the Italian language for the female sex. But if he had been skilled in the Russian language, he would of course have added that it was suited to conversation with all of these. For he would have found in it the grandeur of the Spanish language, the vivacity of the French, the force of the German, and the tenderness of the Italian,

nd, in addition, the richness and strongly expressive laconicism of the Greek and Latin languages."

For many centuries the Russians, among the other Slavs living on the plains of Eastern Europe, were the shield of Europe. They were the first of its peoples to receive the blows of the invasions from Central Asia. Uniting around Moscow, the Russians not only cast off the Tatar and Mongolian yoke, but spread far to the south and mainly to the east, forming a huge state. They brought the elements of European civilization from the west to the Bering Straits, just as the Americans brought them to that point from the east.

In the west the Russians, without ceding an inch of their territory, repelled the attacks of the Germans (the defeat of the Knights of the Teuton Order by Prince Alexander Nevsky on the ice of Lake Peipus in 1242); of the Poles (the expulsion of the Polish troops from Moscow by Minin and Pozharsky in 1612); of the Swedes (the victory of Peter I over the army of Charles XII near Poltava in 1709); and of the French who brought into Russia the armies of all the central States of Europe (the defeat of Napoleon in 1812, when, of the 533,000 soldiers who crossed the Russian frontier in June, about 18,000 were left to recross it during the flight of December). The Prussian King Frederick the Great, the organizer and chief of a first-rate army (judged by the standards of the time) who attacked Russia during the Seven Years' War and for a time lost his capital in 1760, admitted that "Russia was a terrible force."

In the struggle for the reclamation of an immense territory whose area is four times that of Western Europe, the finest features of the Russian character were formed: thoughtfulness, personal courage, persistence, unusual endurance, depth of feeling and a pioneering spirit which indicated inner force. But the creative forces of the Russian people were for a long time kept in abeyance by the yoke of serfdom and autocracy, which condemned them alternately to exhausting labor, or to unproductive inaction.

The well-known German geographer Hettner, who studied Russia at the end of the 19th century, wrote in 1904: "Russia has attained that great future of which she dreams only on condi-

tion that she is regenerated internally. The greatness of Russia and the inner forces which lie dormant in this northern people make it safe to say that this change will take place and will be accomplished by the Russian people themselves." This change was accomplished by the Russian people, at the head of and shoulder to shoulder with the other peoples inhabiting the country, in October 1917. The Revolution liberated the creative energy of the people for the first time in all its force.

Repelling all armed attacks of counter-revolutionaries and foreign interventionists, transforming one-sixth of the earth's surface, and placing an extremely backward country among the advanced and most powerful countries in the world in a score of years—such is the measure of Russian energy.

Moscow

In the center of the more developed, European part of the USSR, in one of the oldest industrial regions and at the point where the most important routes meet, lies Moscow, the capital of the USSR and RSFSR. It is situated on an undulating plain in a spot from which the conifer and deciduous forests have receded, on the banks of the Moscow River, which flows into the Oka, a right tributary of the Volga. Moscow is located at 55° 45' N. latitude, 37° 37' E. longitude. Its average temperature for July is 65.6° F., and for January, 14° F.; its atmospheric precipitation averages 24.1 inches annually.

In the center of the city, on a hill overlooking the river, stands the Kremlin, surrounded by ancient battlements. Ruby-colored stars, emblems of the Soviet Union, gleam on the lofty pointed towers.

The Kremlin is the seat of the Soviet government, headed by Molotov, and is the place where Stalin lives and works. Sessions of the Supreme Soviet of the USSR and RSFSR, and the congresses of the Communist Party are held there. Before the Kremlin walls are the famed Red Square and the beautiful granite mausoleum of Lenin. On fête days the people and the army are greeted by their leaders from the wings of the mausoleum.

Moscow is the center of Soviet culture. It has more than seventy universities and colleges, including the Moscow State University, the oldest in the land. The Academy of Sciences of the USSR, which is more than two hundred years old, is also situated here. There are many historical and art museums. Among the many libraries is the immense All-Union Lenin Library, containing about ten million volumes. In Moscow, which has the largest publishing houses in the world, books are printed in nearly a hundred languages for the peoples of the USSR. Nearly 300 newspapers are published here, among them the "Izvestia" (the News of the Soviets of Working People's Deputies of the USSR) and the "Pravda" ["Truth"], which have circulations of several million. There are nearly fifty theatres in Moscow—before the Revolution there were fifteen. Among the theatres are the famous Moscow Art Theatre (now known as the Moscow Gorky Art Theatre), the Grand Opera Theatre, and others.

Moscow is a highly important industrial city which has attained its present importance in a short space of time. Its industrial output is greater than that of the whole of Russia before the Revolution. At the present time, its industrial output amounts to approximately one-seventh of the total output of the Soviet Union. The whole structure of Moscow industry has been changed. For the most part Moscow in the old days used to manufacture consumers' goods, principally textiles. Today, heavy industry is more important than light industry, its proportion of the industrial output of Moscow having increased from less than one-quarter to over one-half.

A large automobile plant has been erected in Moscow. Cars and trucks which have now become an indispensable item in the stock of Soviet factories, institutions, and collective farms leave Moscow for every corner of the Soviet Union. In the forests of Siberia, in the mountains of Central Asia, one can see cars bearing the trademark "ZIS" (the initial letters of the Russian words meaning "Stalin Motor Works"). The ball-bearing plant of Moscow is one of the largest in the world. Its departments, all housed in one spacious building 1,400,000 square feet in area, look like an exhibition of the latest models of machines. Moscow produces

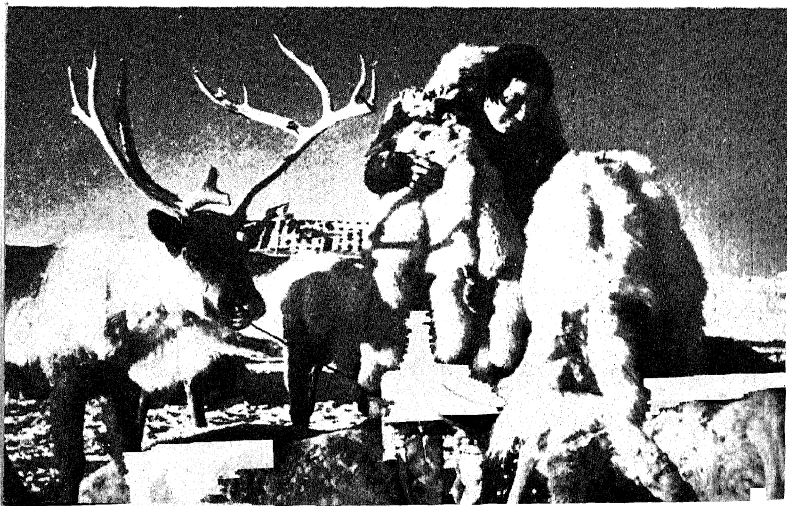


Latest model from the Stalin auto works of Moscow
starting on a trial run



Logging in the northern woods with a Stalinet tractor

A trapper of the Soviet north loading a reindeer sledge with fox skins



high-grade steel; its textile and clothing industries have been reconstructed; huge works manufacturing complex machinery have been constructed to produce electric locomotives, electrical equipment, lathes, measuring instruments, bicycles, precision instruments, etc.

Moscow is the center of a single, unified power system, which embraces the power resources of several regions; its capacity is among the foremost in Europe.

Moscow is an important transportation junction. Eleven railways meet here: four of them are electrified in their suburban sections. The freight turnover of this junction has increased three-fold in comparison to pre-revolutionary days. Airplanes leaving the airport of Moscow fly to every corner of the Soviet Union, and to foreign countries.

Moscow is the largest city in the country. Its population, having increased rapidly after the Revolution, now numbers four million, or two and a half times its pre-revolutionary size.

Moscow was known to early chroniclers as far back as 1147, but evidently it existed in earlier times. At first, it was a small settlement near the mouth of the river Neglinka. In 1156 a strong wooden wall was erected. By the 14th century, it had become the chief town of a principality. The town grew: the Muscovite princes united all the appanages around Moscow. Its development was furthered by its convenient location on waterways. In the middle of the 15th century, Ivan III consolidated his power over all the Russian lands, and became the "ruler of all Russia." During this period the walls of the Kremlin, which are still standing, were built.

Active in the national unification of the Russian people, the city's growth kept pace with the growth of the Russian state.

Moscow possesses many relics of ancient architecture, including the Cathedral of the Assumption (1479), the Archangel Cathedral (1509), and other remarkable buildings inside the Kremlin walls. The Church of St. Basil, which stands in the Red Square, was built in 1560 and is a marvelous example of architectural ingenuity. It is a fantastic combination of nine churches sur-

mounted by cupolas, each having a different shape and color. It is now maintained as a museum.

In 1714, Peter the Great transferred the capital of Russia from Moscow to St. Petersburg, now Leningrad. In 1918 Moscow once again became the center of the country. It was made the capital of the RSFSR, the headquarters of the Revolution. During the years of the Civil War all the attempts of the counter-revolutionaries and interventionists to take Moscow were defeated. In 1922 Moscow became the capital of the Union of Soviet Socialist Republics, which was formed in that year.

For centuries Moscow had grown like a tree—by the addition of rings around it. As the town expanded it surrounded itself with concentric circles of fortress walls which were subsequently demolished, leaving circular avenues such as the Boulevard Circle and the Garden Circle. These are intersected by streets which diverge in radii from the center: it was thus that the trade routes from old Moscow to other towns passed through the fortress walls. This interior plan bore witness to the fact that Moscow was the historical center of the Russian land.

Old Moscow was crowded and dirty. Crooked roads lay between the circular and the radial streets. Two-thirds of the houses were wooden. A third of the population lived in hovels and overcrowded factory barracks, while a tenth lived in basements. Half the houses were only one-story high; one-third were two-stories. The suburbs were lighted by kerosene lamps.

The October Revolution has placed good houses at the disposal of the workers; the barracks were destroyed. During the years of the Five Year Plans, the reconstruction of the growing metropolis was begun and developed.

The problem of the reconstruction of Moscow was widely discussed. There were architects who proposed that Moscow should be demolished, that a park should be laid out in its place, and that a new town should be built close by. Some proposed that Moscow should be preserved without any alteration as a museum. Others wished to allow Moscow to grow without radically altering the city. A different point of view triumphed, one that corresponded with the essence of Soviet culture. A decision on the

general plan of the reconstruction of Moscow was taken in 1935, to cover the next ten years. Stalin took a personal and leading part in the elaboration of this plan, which provides for the complete replanning of whole districts and streets with the retention of the foundations of the historically developed city. The correct disposition of enterprises and dwelling-places, the regulation of the transport and warehouse systems, the laying of sewers, the straightening and widening of streets, shifting of the town to the southwest, and many other measures, are all conceived with the direct purpose of providing for the comfort of the population to the fullest extent. Landscaped sections will occupy a total of one-third the area of the city. Exceptionally wide main roads will cross the city at different angles. The size of the districts will be increased and each district will, for the most part, contain its own cultural and other institutions—schools, clinics, restaurants, kindergartens, crèches, shops, and gymnasiums. Railway traffic will be completely electrified.

This plan was accepted and is being carried out. The streets have been paved, and seven new wide bridges span the river. Houses from six to fourteen stories high are being erected: within fifteen years Moscow has received more than 54 million square feet of new living space; nevertheless, even this addition is insufficient for its needs. New large motion picture theatres are centrally located in all districts. Many huge public buildings have been erected. During the last four years 350 new secondary schools have been built. Houses having no historical value are razed in order that the streets may be widened to accommodate the greatly increased number of automobiles. Power stations have been erected. The foundation has been laid and the steel framework is in course of construction for what will be the world's tallest building, the Palace of the Soviets; nearly 1365 feet high, crowned with a 262-foot statue of Lenin, and containing an auditorium that will seat 21,000 persons.

The Metro, or subway, which was constructed in record time, is now operating in several directions from the center of Moscow. In common with every socialist enterprise, the complete absence of profit-making has served to eliminate all hindrances to the comfort

of passengers. Everything has been done to make a journey in the Metro pleasant and restful for people traveling to and from work.

Each station in the subway is of individual architectural design, planned by the best architects of the capital. The underground corridors have been constructed in polished marble and granite, and decorated with porcelain and stainless steel. In addition to these aesthetic distinctions, the Moscow Metro has technical advantages over the underground railways of other cities of the world; for example, it possesses the greatest radii of curvatures, and the least number of gradients. The underground stations are illuminated with far greater brilliance than the stations of all other underground railways. More fresh air is pumped into the Moscow Metro than into the New York subway.

The Moscow River gave its name to the capital, but was unable to provide it with sufficient water. Three-quarters of the annual flow of the Moscow River passed through it within a single month during spring, and in summer the river scarcely moved. This industrial city consumed nearly half the river.

Other waterways lay at a distance from Moscow: the Volga passed it from the north, the Oka from the south. Only small vessels were able to sail up the shallow Moscow River to the town. The port dealt with only an infinitesimal part of the freight handled by the Moscow railway junction. Bulky goods, such as timber, oil, and building stone, were carried by rail, and not by cheap water transport. This geographical flaw has been corrected. The decision, taken at Stalin's suggestion, to construct the Moscow-Volga Canal, has been carried out. A concrete dam and a dike nearly five miles long at the upper part of the Volga, near the village of Ivanovo, to the north of Moscow, raised the level of the river 56 feet, and formed the reservoir known as the "Sea of Moscow," 126 square miles in area, with a capacity of over 264,200 million gallons. The site of the town of Korcheva was inundated. A hydro-electric station was constructed alongside the dam on the Volga, and part of the raised water was made to flow through an artificial bed, lying in a deep groove on a high aqueduct.

(See Map 3, page 12.)

The rising ground between the Moscow River and the Upper

Volga is crossed by a canal 80 miles long. Electricity forces the water to flow upwards, and not down: five pumping stations, equipped with propeller pumps, force the river to the watershed, each pumping as much as 26,420 gallons per second. Part of the electric power expended on raising the water 125 feet is recaptured: as the water flows downward towards Moscow, it passes through the turbines of new hydro-electric stations.

The work of the Moscow electric system, as of every other electric system, is not spread evenly over the whole twenty-four hours: in the evening, towns and plants require more electricity than in the daytime or at night. The power stations of the canal generate electricity in the evening, when it is most required; on the other hand, the canal lift pumps work and receive power from the electric system during the hours when Moscow has least need of it. Thus the curve of power supply has been rectified.

The new watercourse, equivalent to five Moscow Rivers, has entered the town. The loops in the river have been straightened out and a port for large motor vessels has been constructed.

After standing for a hundred days in an artificial forest reservoir in order to allow the sediment to settle, part of the water taken from the Volga passes into a water conduit (the largest such system in the world) and forms the water-supply of Moscow, which is equal to that of the most modern cities of the world.

The canal has: 11 sluices; 7 lake reservoirs; 7 hydro-electric stations; bridges over the canal; tunnels under the canal; newly planted forests on its banks. The locks function automatically. Original ideas and new methods of building were introduced, and the whole canal is distinguished by fine architectural design. All of the work was planned by Soviet engineers and executed with materials of home production.

In certain countries the erection of great hydro-technical projects leads to the ruin of industries and the surrounding agricultural population. In the Soviet Union hydro-technical construction is so planned that, at the same time that important national-economic problems are solved, every condition is created to ensure the rapid development of local industry. Thus, in the course of the construction of the Moscow-Volga canal, scores of villages had to be re-

moved from the flooded zones. What happened was that in place of their dilapidated huts, the peasants were given new modern houses and villages in newly developed districts at government expense. The absence of private ownership of land, and the planned character of the entire enterprise made it possible to accomplish the reconstruction and improvement of economy throughout the entire zone of the canal.

The scale and speed of construction can be seen from the following figures: 260 million cubic yards of earth were excavated, 4 million cubic yards of concrete were laid, and over 620 miles of auxiliary rails and about 1250 miles of motor transport roads were constructed. The mechanization of the work and its general organized character permitted finishing of the canal's construction in less than five years.

On May 2, 1937 the first vessels arrived in Moscow from the Volga via the Canal. The waters of the largest river in Europe now flow under the Kremlin walls, and the capital of the Soviet Union is connected with two oceans.

THE OLD INDUSTRIAL CENTER

Moscow is situated in the center of the oldest industrial region of the country, which lies mainly between the Oka and the Upper Volga, in the center of the European part of the USSR.

The zone of mixed forests stretches across this region; in the north they are replaced by conifer forests, in the south by the forest steppe belt. In the south, black soils take the place of the podzol soils. The old industrial center includes the Moscow, Ivanovo, Yaroslavl, Gorky, Tula and Ryazan Regions with a total area of more than 115,830 square miles. This district is of immense importance in the national economy of the Soviet Union. It is densely populated, and approximately 30% of industry is concentrated here.

After the Revolution a great change took place in the character of the old industrial center. Before the October Revolution this region was a metropolis to which the colonial outlying districts of Russia were subject; it was the nucleus of the State. Here capitalism was founded and developed. The center flooded the outlying

districts with its manufactured goods and, with one or two exceptions, did not permit them to develop their own industry, forcing them to produce raw materials only. On the industrial map of the country, the center stood out like a mountain in a plain, or an island in the sea.

In a socialist country the development of an individual region cannot be retarded on account of the selfish interests of another region. The planned and even distribution of industry in the USSR has commenced: this means that the rate of industrial construction in the formerly backward outlying districts is higher than the rate of development of the old center. As a result, every region in the country has turned into a more or less industrialized region. The center is no longer a metropolis, an island in a sea of backwardness.

But the development of the agrarian outlying regions of the country, whose technical level was often no higher than that of the Middle Ages, required the aid of the advanced center. The national-economic plan assigned this role of leadership to the central region. Thus the most advanced section of the country, without regard to its narrow local interests, began to assist the development of the less advanced regions in every possible way, signifying the basically disinterested aid given to other nationalities of the Soviet Union by the Russian people. For example, the development of the light industry of the Soviet Transcaucasus began when the center took a textile mill to pieces and transported it to that region. Many of the best workers of Moscow went to Kazakhstan in Central Asia to assist the organization of industrial production there. Scientific problems arising out of the industrial development of outlying regions are dealt with in institutes of the central region. Complicated machinery is supplied to the outlying regions from the center. Until the new regions possessed their own universities, engineers for the outlying regions were trained in the center, but even now the overwhelming majority of the graduates of the central universities are sent to the outlying regions. In tsarist days, the center purposely retarded the industrial development of the outlying regions. Now as part of the USSR, the same center, having rid

itself of its self-interested bourgeoisie, helps the outlying regions to develop more rapidly than it does itself.

The growth of new regions, however, does not entail the extinction of the old regions, as had happened in certain other countries. For example, the creation of new textile regions in the south (in Central Asia and the Transcaucasus), proceeded simultaneously with the rapid development of the old textile industry of the center: within the post-revolutionary period to 1937 the output of the textile industry of Moscow alone increased fivefold and more. The center continues to develop rapidly, but less rapidly than the new regions.

Before the Revolution light industry, chiefly textile manufacture, predominated in the center. Moscow was known as the "town of cotton print." With an industrial structure such as this the center could not have been the instrument for industrializing the rest of the country. The structure of industry in the center was therefore altered in accordance with socialist planning. A strong machine-building, chemical, and electrotechnical industry was created there. Before the Revolution the proportion of machine-building in the industry of the Moscow Region was equivalent in output to 8%; by 1935 this figure had risen to 29%, and it is still rising. Within the same years the proportion of output of the textile industry had fallen from 54% to 22%, though its absolute growth, as has been shown above, has been very rapid.

Before the Revolution the industry of the center operated on fuel brought from other regions. From the point of view of national economy as a whole this was irrational, but the Donetz coal basin, with which were connected important interests of influential capitalist circles, did all in its power to stifle its competitors, including the Moscow coal basin, which lies in the central zone. After the Revolution such competitive obstacles were removed. The state assigned large sums to the exploration of local sources of power. As a consequence the ascertained deposits of lignite near Moscow (in the Ryazhsk, Tula, and Kaluga districts) have increased twelvefold. Effective methods of coal-dust combustion were elaborated. The output of Moscow brown coal grew from 0.3 million tons in 1913 to 7.4 million tons in 1938. Large new electric power stations are utilizing this fuel. As a result of the development of industry,

more coal is brought to the center from the Donetz coal basin than before, but the proportion of local lignite in the total amount of fuel used in the Moscow Region had increased by 1937 practically from zero to 39%. Electric power stations functioning on peat have been established and in 1937 the proportion of peat in the fuel of the Moscow Region was equivalent to 23%. Hydro-electric stations were constructed for the first time in the center, on the Moscow-Volga Canal, as new social conditions enabled the center to develop its own power base.

Thus was industry, which occupied the chief place in the economy of the center, transformed. But agriculture was transformed as well. Formerly the European part of Russia was divided into two sharply contrasted zones: in the north, the region of non-black soils, lay the so-called "consuming" zone; in the south, the black soil region, was the "producing" zone. The borderline between them ran approximately along a line parallel to the River Oka. It seemed to be fixed and incontestable.

In the consuming zone, which included the non-black soil regions of the industrial center, there was a lack of grain: an insufficient supply of rye, and wheat was hardly sown at all. Grain was brought from the south.

The pre-revolutionary petty peasantry of the non-black soil zone, hampered as it was by the remnants of serfdom, was unable to increase its sowing area and improve its economy. It was incapable of competing in the market with the wheat of the colonized lands of the southeast of Russia (the Left Volga Region, the North Caucasus, Western Siberia). The treeless black-soil tracts in those sections were tilled rapidly and easily. The podzol lands of the north, on the other hand, had to be cleared of forests and thickets, drained, and fertilized. Yet the non-black soil zone possessed every natural feature requisite to a great wheat district: millions of acres of shrubby land to be tilled; sufficient warmth, though less than in the southern regions; freedom from the deadly breath of periodic droughts, which often decreased the harvests of the south; more stable and higher yield crops than those of the south.

During the period of the First Five Year Plan a large-scale industry sprang up in the southern, formerly almost wholly agricultural,

regions. Large towns arose amid the wheatfields. The area under crop was extended, but now the south could no longer give up the same portion of its harvest as formerly, and the north was obliged to provide itself with its own grain. In 1934, at the 17th Congress of the Communist Party, Stalin said: "Our task is to create a great grain tract in the regions of the consuming zone."

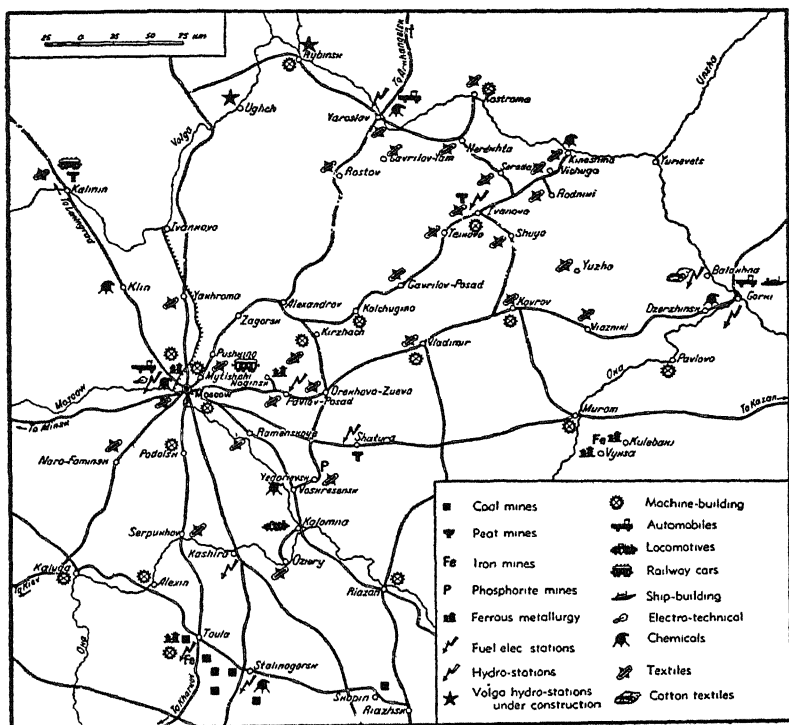
What was formerly impossible for poor and scattered individual peasant farms to do alone was accomplished by collective farms, which worked according to a definite plan, were equipped with machinery, and provided with fertilizers. In the Moscow Region (1936 boundaries) before the Revolution there were 500,000 wooden plows and not one tractor; today there are ten thousand tractors and not one wooden plow. The wheat map was transformed. Wheat is sown not only in the south, but in the north as well—from the Oka to Lake Onega—each year in increasing quantities. Rapidly the division of the country into "consuming" and "producing" zones, which had prevailed for many decades, is being wiped out. The non-black soil regions, including the regions of the industrial center, are at last providing themselves with their own grain. The creation of a new wheat belt in the center of the European part of Russia can be seen on map 11 (page 55).

The agriculture of the non-black soil region specializes in flax, milk, and vegetables, but its grain output is increasing as well. There are fields in some of the best collective farms in the Moscow Region which never knew wheat before, but which today yield approximately 4,400 pounds of wheat per acre. In 1928 the area of the land under wheat in the non-black soil zone was 1,112,000 acres, whereas in 1937 it was close to 7,410,000 acres, an increase of more than sixfold.

Railways radiate in every direction from Moscow. Whichever way we turn, we see how the Old Industrial Center has changed. The location of the industry in this region can be seen on map 16 (page 95).

A railway runs in an easterly direction to Kazan, on the Volga, and paralleling its tracks are telegraph poles with their wires stretched high above the trees. Electric transmission extends to Shatura where the first powerful peat-burning electric station has

been erected. It bears the name of Lenin, who inspired the electrification of the Soviet Union. The power station, with its smoking chimneys and huge windows, rises in the landscape of lakes and coves like the personification of the industrial regeneration of the country.



MAP 16—OLD INDUSTRIAL CENTER

Alongside the railway from Moscow to Kazan is a line to the town of Gorky (formerly Nizhni-Novgorod on the Volga). It passes through the old textile district of the Moscow and Ivanovo Regions, where many decades ago the foundations of a handicraft textile industry were laid and subsequently replaced by factory production. Wherever there is a village there can be seen the red-brick

buildings of a cotton mill. Even before the Revolution many of these villages had been transformed into large industrial towns, as, for instance, Orekhovo-Zuyevo, Noginsk (formerly Bogorodsk), Pavlovo-Posad, and others. Today these towns are further changing their appearance. Textile manufacture is being perfected. Reconstructed and improved mills are producing more and higher quality fabrics of all kinds. At the same time heavy industry has made its first appearance here.

In the Noginsk district, for example, a high-quality metallurgical industry has come into being: stainless and swift-cutting steels are smelted in its electric furnaces. The town of Vladimir on the River Kliazma (a left tributary of the Oka) which is more ancient than Moscow and possesses marvelous examples of antique Russian architecture, today manufactures not only cotton print, but motor equipment, gramophones, and wares made of plastic materials. In Kovrov the textile industry has been supplanted by the production of excavators, fireboxes, and other things.

The town of Gorky, the birthplace of Maxim Gorky, stands at the point where the Oka flows into the Volga. This is a large industrial town with a busy wharf. Milling machines, diesel engines, river and sea ships, wireless apparatus, etc., are manufactured at the new and reconstructed works and factories. A motor works, the so-called "GAZ" (the initial letters of the Russian words meaning "The Gorky Motor Works"), one of the largest in Europe, was erected in Gorky. Even in 1937 it manufactured more trucks than all automobile works in England taken together.

In the Gorky Region steel is manufactured from metal scrap; a great industry of metal wares and instruments, and also of footwear, has grown out of petty handicraft industries. A new chemical combinat* and a new paper combinat, one of the largest in Europe, are in operation. A large electric power station, fuelled by peat, has been erected. Woodworking and timber chemical industries have sprung up in the wooded Left Volga Region, which until quite recently had no industry whatever. During the Second Five Year Plan period the production of industry in the Gorky Region increased by 3.4 times.

* Combinat, or combine: a group of interrelated plants and industries.

The rural districts have changed as well. Here, for example, is Maidan, an ordinary village in the Gorky Region. The whole culture of the village before the Revolution was expressed in the existence of a parish school with one teacher. Today the collective farm "Red Partisan" is situated there. The parish school has been replaced by a secondary school with eighteen teachers. Close to fifty collective farmers are students at universities and technical schools. The village has already produced two engineers, three airmen, fourteen teachers, two doctors, and about twenty tractor and combine-harvester operators. The collective farm possesses its own hospital, crèche, maternity home, and electric power station.

The Yaroslavl Railway runs in a northeasterly direction from Moscow. Passing Mitishchi, with its carriage-building works, Zagorsk, famous for its wooden toys, and Rostov, an important market-gardening center, the train arrives at Yaroslavl.

Yaroslavl is the oldest Russian town on the Volga. The walls of its kremlin (or citadel), the relics of a bygone age, are still standing. The first flax mill in Russia was erected in Yaroslavl, and the foundations of the first Russian theatre were laid in that town in the middle of the 18th century. After the Revolution there were created in Yaroslavl a motor works, where omnibuses, lorries, and one- and two-deck trolleybuses are constructed; and a rubber and asbestos combinat, consisting of several factories manufacturing tires, shoe soles, etc. The first synthetic rubber works in the world, its raw material consisting of potatoes, was erected in Yaroslavl; similar works have now been constructed in other places.

The enterprises of Yaroslavl are united by the national-economic plan in the service of one common object: automobile construction. The various combined works, which, in accordance with the plan, transfer their products to each other, manufacture rubber, technical fabrics for tires, tires, motor varnishes, and, finally, automobiles.

Textile production, both cotton and flax, occupy an important position in the industry of the Yaroslavl Region; during the period of the Five Year Plans here, as in every region of the center, a chemical industry and machine-building were born and developed. The largest towns of the Yaroslavl Region are situated on the

Volga. Below Yaroslavl lies Kostroma, with its great new flax combinat. Above Yaroslavl is Ribinsk, and just opposite the town the Sheksna flows into the Volga from the left. This river is the first link in the Mari waterway system, which was constructed in the 19th century to establish a direct waterway between the Volga and St. Petersburg.* Ribinsk produces ships, printing-presses, and road machines. Near it, and at Uglich on the Volga, two huge hydro-electric stations of 330,000 and 110,000 kilowatts are in course of construction. They will generate electricity and increase the depth of the river.

A branch-line of the Moscow-Yaroslavl Railway extends in an easterly direction from Alexandrov Station to the town of Ivanovo. This town possesses a new and, for its dimensions and type of production, unique (in the USSR) combinat for the manufacture of mixed-color clothing fabrics; greatly enlarged cotton mills; works manufacturing, for the first time in the region, looms and peat machines. Since 1926 the population of the town has more than doubled.

Textile production is proportionately greater among industries of the Ivanovo Region than in the Moscow Region. The cotton industry is concentrated in Ivanovo and in the surrounding towns of Shouya, Vichoug, Kokhma, Rodniki, and others. In Rodniki, the assistant director of the large textile combinat is Klavdia Sakharova, a weaver, advanced to this post because of her distinguished work. She is also the youngest deputy of the Supreme Soviet of the USSR who, in spite of the great responsibility and authority this position entails, was elected at the age of nineteen.

Not far from Ivanovo lies the village of Palekh, whose local handicraftsmen, true artists of the people, enjoy world-wide fame. For many centuries Palekh was one of the centers of Russian icon-painting. Subsequently the Palekh craftsmen turned their attention to the painting of papier-mâché articles, and in recent years to textile patterns, book illustration, porcelain painting, and theatrical

* The waterway lies along the Sheksna, the irrigation canal by Lake Beloye, the Kovzha, the Mari watershed canal, the Vitegra, the canal by Lake Onega, the Svir, the canal by Lake Ladoga, and the River Neva. During the Third Five-Year Plan period the Mari waterway system will be radically reconstructed.

decoration. Since the Revolution the State Museum of Palekh Art and an Art School have been created in Palekh.

A large number of industrial towns lie along the railways which run from Moscow in a southerly direction. Even in the most ancient of them, in towns where the moss-grown ruins of fortress walls and towers, relics of ancient historical times, are still to be seen, new machine building and chemical enterprises, equipped with up-to-date complex machinery, have been erected: in Kolomna, for example, where the rivers Moscow and Oka meet, a plant several times as large now as it was in former days, is in operation, producing steam engines, electric locomotives, steam engines with condensers. A large electric power station has been erected in Kashira, fuelled by Moscow lignite. In Podolsk machine-building has been developed (the manufacture of cracking plants, sewing-machines, etc.). Textiles are produced in Serpukhov and Ramenskoye. Agricultural machinery is made in Liubertsy. In Voskresensk, fertilizers are manufactured from local phosphorites at the new chemical combinat.

In the south, beyond the Oka, the forest zone is replaced by the forest steppe. Here lie the Tula and Ryazan Regions. Ferrous metallurgy in Tula has been extended and metal-working has been reconstructed. By 1939 the smelting of pig-iron has increased thirteenfold as compared with the pre-revolutionary period. At the same time, a machine-building industry sprang up in other towns—in Ryazan, Kaluga, and so on.

The Moscow lignite coal basin, which lies comparatively near Moscow, with resources totaling 12,500 million tons, is being developed. In the region to the southeast of Tula, the Stalinogorsk chemical combinat and an electric power station—whose turbines attain a capacity of 100,000 kilowatts—have been constructed. High tension wires transmit the electricity to the power system of the Moscow district.

The underground gasification of coal is proceeding in the Moscow coal basin. An immense stratum of coal has been struck at a depth of 207 feet at Novo-Bassovskaya station, for example. Oxygenized air is forced underground by compressors; the coal burns, and the

gas which it generates passes through pipes to the surface, where it is utilized.

Not far from Tula is Yassnaya Polyana, known throughout the world as the place where Leo Tolstoy lived and worked.

THE BLACK SOIL CENTER

Through the Tula and Ryazan Regions there is a gradual transition to the regions of the so-called Black Soil Center—the Kursk, Oriol, Voronezh, Tambov and Penza Regions—with a total area of over 77,200 square miles.

The regions of the Black Soil Center lie in the districts around the upper parts of the Rivers Oka and Don, between the Old Industrial Center in the north and the Ukraine in the south, at a considerable distance from the sea. It is over 600 miles from Voronezh to the Baltic Sea, and about 370 miles to the Black Sea.

The Black Soil Center has fertile black soil; a mild climate, well suited to agriculture; a gently undulating, much-tilled and almost treeless plain; sparsely scattered, small islands of birch and oak woods, river banks bordered by pinewoods.

Before the Revolution these regions were known to science as the "impoverished center." After the abolition of serfdom in 1861, the best lands remained in the hands of the landowners. The peasants received very little land and even this had to be redeemed; they were thus heavily burdened with a lease which bound them hand and foot. The land, which was leased for a limited period, was not cared for; it became exhausted, yielding small and smaller harvests each year. The peasants were unable to improve farming methods, while the landowners and kulaks found it more advantageous to use the cheap hands of the starving peasants than machines. Lack of land and hunger caused the peasants to till their last meadows and to cut down their last trees. Without meadows there could be no cattle-breeding, and consequently the plowed fields remained without manure, *i.e.* without fertilizers. The land became rutted as a result of the destruction of the forests, with the result that the tillages were diminished and the level of the subsoil waters was lowered. The fields were furrowed with boundary lines.

The soil was plowed with the "*sokha*," the wooden plow, and the seeds were scattered by hand out of bast baskets. Nearly half the peasant farms sowed no more than seven and a half acres. Each year a third of the plowlands lay fallow. The towns of the black soil region possessed scarcely any industry; the people having nothing to live on, left the land to seek a livelihood in Moscow and the Donetz Basin, or migrated to Siberia.

Today a new country has been brought into existence here: with large State farms, with well-to-do collective farms, with scientific husbandry, and with a regenerated soil.

After the October Revolution the peasants received the millions of acres of land which had belonged to the landowners. Collective farms came into being. The boundaries were plowed up. The three-field system was done away with, and agricultural machines were introduced. Scientific tilling, the use of fertilizers, and correct rotation of crops increased the harvests. The proportion of crops was altered: wheat, sugar beet, hemp, and potatoes now began to preponderate over the "grey grain"—rye and oats. New crops were introduced, as, for example, soy beans. Rubber plants are cultivated extensively. The ditches are being done away with by the afforestation of immense tracts of lands. Deep plowing regenerates and cultivates the soil, enriching its nutrient stratum. Cattle-breeding is developing on the newly sown grass lands, and not a trace remains of the former "impoverishment."

In the place of fields with overlapping land strips of individual peasant farmers, there are now extensive, unbroken fields with lofty elevators and ensilage towers, with the new buildings of machine and tractor stations; State farms and collective farms, with new motor roads.

In 1901 and 1907, Dr. Shingariov, who was subsequently one of the leaders of the Party of Constitutional Democrats—chief party of the Russian bourgeoisie—and a Minister in the Provisional Government, inspected two villages in the Voronezh Region, Novozhitovinnoye and Mokhovatka. In his book, "The Dying Village," he wrote of them: "They will apparently continue to exist until they are completely ruined and die out. It is indeed scarcely comprehensible how agriculture can be continued when the area of land

owned by the population works out at only 8/10 of an acre per head, while tillage is only 13/100ths of an acre per head—and many householders possess no tillage at all. How can agriculture be continued when the average rent for the land is equivalent to the gross profits from the harvest, and when even the rent is beyond the means of a great many? . . . There are a large number of households which are unable to buy cabbage, cucumbers, and meat; and entire families are without milk the whole year round. Is this not chronic malnutrition, terrible, constant poverty, which is nourished on rye bread and now and again on porridge?"

These dying villages were not even rare or exceptional among other villages of the Voronezh District or the Black Soil zone as a whole. But the Soviet State increased peasant land tenure in Novozhivotinnoye and Mokhovatka more than sixfold (from 870 to 5,434 acres). By 1956 the peasants would have had to pay 1,539 rubles as interest on their land debt, but the Revolution freed them of all debt. Stone buildings, electric power stations, schools, creches, and children's homes have been built in the collective farms of those nearly extinct villages. The ramshackle huts have disappeared. Primitive tools have been replaced by tractors, combine harvesters, and threshing machines. Harvests have increased. The collective farmers lead a prosperous life. They buy their clothes and utensils in the towns. The villages of Novozhivotinnoye and Mokhovatka have produced engineers, airmen, tractor operators, land surveyors, librarians, and experts in other professions.

Within the last three months of 1937 the collective farms of the Voronezh Region bought 150 oil engines, 929 lorries, several dozen pianos. The collective farmers bought 686 bicycles, 500 sewing-machines, one thousand gramophones, 950 watches, including wrist watches. In 1936 in the Voronezh Region there were 40 district Houses of Culture, 1,857 cottage reading-rooms, 1,200 collective-farm clubs, over 1,500 libraries with 5,000,000 books. A permanent branch of the Little Theatre of Moscow has been established in the village of Zemetchino.

The famous Russian horticulturist Michurin lived and worked in Kozlov (in the Tambov Region). He produced over three hundred new kinds of fruits, which are remarkable not only for their quality,

but also for their resistance to adverse natural conditions. He got them by crossing different varieties of one fruit and also entirely different species, as, for example, the apple and the currant. The government of the USSR did its utmost to aid Michurin in his work. He headed a large staff of scientific collaborators who worked in well-equipped laboratories. After Michurin's death, in 1935, his work continued. The Michurin Institute has fifty branches scattered all over the Soviet Union. The town of Kozlov has changed its name to Michurinsk. It is a scientific center for the moving of horticulture to the north—a process which is being accomplished in the USSR on a vast scale.

Formerly the regions of the Black Soil Center were purely agrarian; now industry is growing there. The food industry is developing in the towns, as well as machine building; the textile industry in Orel, for example, and railway construction in Tambov. A locomotive construction works has been enlarged in Orjonikidze-grad, near Briansk. Ferrous metallurgy based on the local ores has developed in Lipetsk. Large oil mills have sprung up in the Tambov and Voronezh Regions. The Kursk Region stands first among the regions of the RSFSR in sugar output. During the two Five-Year Plan periods the industrial production in the Voronezh Region, for instance, increased by sixteen times.

The change which has taken place in the aspect of the towns of the Black Soil Center may be illustrated by the following example. Before the Revolution the whole of the industry of Voronezh (on the River Voronezh, which flows into the Don) consisted of a small cast-iron foundry, a bell foundry, three distilleries, and a few steam-mills. There were 3,500 workers in the town. Today in Voronezh close to ninety thousand workers are employed in advanced up-to-date enterprises, producing synthetic rubber, wireless apparatus, Diesel engines, machine-bakery equipment, spare parts for tractors, and repairing locomotive engines and carriages. In the town there are 12 universities, attended by ten thousand students—future agriculturists, doctors, chemical engineers, veterinary surgeons, building engineers, and teachers.

The iron ores of the Kursk magnetic anomaly to the southeast of Kursk will play an important part in the industrial development

of the black soil zone. During the Third Five-Year Plan period, great work will be done in exploiting these ores.

THE WEST OF THE EUROPEAN PART OF THE RSFSR

To the west and northwest of Moscow—between the central regions and the Byelorussian SSR—lie the Smolensk (28,000 square miles) and Kalinin (42,000 square miles) Regions. In the west the Kalinin Region borders on Latvia.

Podzol soils, an abundance of forests in which there are few peat bogs, characterize this country. Here, in the district of the Valdai (whose highest point is 1056 feet), rise the rivers Volga, West Dvina, and Dnieper, each taking a different direction as it leaves its source. The swampy upper regions of these rivers are joined during the spring floods. Many forest lakes, foremost among them being Lake Seliguer (90 sq. mi.), give to the Valdai Hills a picturesque character.

The main item in the agriculture of these regions is the cultivation of long-fibred flax, from which linen is manufactured. The natural conditions are eminently suited to the cultivation of this crop: long summer days, that are not too hot, abundant moisture, suitable soils. More flax is sown in the Kalinin Region alone than in the whole of western Europe of which the USSR is the largest flax growing country.

The cultivation of the flax plant, which requires a great deal of labor, is being mechanized. Flax seeders, teazling machines, and other up-to-date machinery for flax cultivation are at work on the collective-farm fields. The old tools—the cylinder, the barrel, the brake, and the teazle—are being replaced by flax harvesters, flax mills with chemical retting, and improved combined braking and teazling machines. Selected species of flax have been introduced and tests for higher yields are in progress. Clover, the basis for the development of dairy farming, is sown alternately with flax for the purpose of constantly renewing the fertility of the soil. Wheat and potatoes occupy increasingly larger areas.

A manufacturing industry based on the flax resources of the regions has been created for the first time: a large flax combinat,

for instance, has been erected in Smolensk (on the Upper Dnieper). Kalinin (former Tver) (situated at the point of intersection of the Volga and Moscow-Leningrad Railway) possesses a cotton and a carriage-building industry. There are many woodworking factories, fuelled for the most part by peat.

The majority of the peasants of the western regions of Russia used to live in "khoutors" (small scattered farms). Under the collectivization and socialization of the means of production, these "khoutors" have become a hindrance to labor cooperation between the peasants. The isolation of these farms from one another impeded the growth of culture. Today the collective farmers choose to move from their farms into large well laid-out villages. The village which recently sprang up on the territory of the Zolotovskiy Village Soviet is typical of these newly-created settlements. It contains fifty collective-farm homesteads; the streets have been laid by plan; the houses are surrounded by gardens. A public garden is situated in the middle of the village, and a green forest belt surrounds the village. A school and a collective farm club have been erected. Hundreds of tiny settlements are vanishing from the map. In 1938 alone, 336 "khoutors" were abolished in the Safonov District, Smolensk Region.

THE NORTHWEST OF THE EUROPEAN PART OF THE RSFSR LENINGRAD

At the point where the Neva flows into the Gulf of Finland, stands Leningrad, the northernmost metropolis in the world (59° 57' N., 30° 19' E.). Leningrad lies 4° to the north of Moscow, but its climate is milder due to the proximity of the sea. The average temperature for July is 63.5° F.; for January, 18.3° F. Atmospheric precipitation amounts to 20.6 inches.

For two centuries this town was the capital of Russia, the residence of its tsars. Here the Socialist Revolution, led by Lenin, began in 1917. Until 1914 it was called St. Petersburg; from 1914 to 1924 Petrograd.

The Neva has granite embankments. The damp soil is covered by paving-stones and asphalt. A hundred islands are connected by five

hundred bridges. Broad, straight avenues were laid under the misty northern sky. The town was well planned; its architectural design is harmonious. The steel-grey waters of the canals reflect the facades of the palaces, whose architecture shows a transition from the baroque style to classicism and the majestic Russian Empire style. The low banks are counterpoised, as it were, by the lofty spires of the Admiralty and the Peter-and-Paul Fortress.

The town was built according to the project of Peter I who, at the beginning of the 18th century, determined to transform Russia into a European State, emerged here at the sea, face-to-face with western Europe, after having defeated the Swedes. Peter combined a capital and a port in one spot at the edge of the country. The town was connected with the west by the sea, with the rest of the country by waterways (the Mari system), and subsequently by railways. This was the eccentric center of the Empire.

In relation to the countries of the west St. Petersburg was only an appendage. At its works were assembled machinery parts imported from abroad; English coal burned in its furnaces; cotton, metal, rubber, and even fire-clay were imported from the West; the majority of the enterprises belonged to foreigners.

In relation to the rest of Russia, however, St. Petersburg was the leading and the most highly cultured industrial center; the comparatively high cost of labor gave incentive to the introduction of technique; demand in the capital led to the improvement of manufactured goods.

The October Revolution began in Leningrad. Here, in October, 1917, the resolution to call an armed rising was passed, on Lenin's motion, at a sitting of the Central Committee of the Bolshevik Party, and a fighting center to lead the rising was created, with Stalin at its head.

On October 25th (New Style—November 7th), an armed rising overthrew the bourgeois Provisional Government headed by Kerensky and the Government and the power passed into the hands of the workers and peasants.

During the process of industrializing the country, the Soviet Government gave Leningrad, which possessed a high technical culture and skilled engineers and workers, the responsible task of

mastering new complicated industrial processes, with a view to their being used all over the country. This task was accomplished.

During the period of the two Five Year Plans Leningrad learned to produce hundreds of new products which formerly used to be imported. The first Soviet blooming-mill, the first turbine generator, and many other machines, were made in Leningrad. The manufacture of complicated machinery could be set going here more easily than anywhere else, its mass serial production being subsequently established in branch plants in other towns. For example, between 1924 and 1925 the Red Putilov factory of Leningrad put out 73 tractors, the first Soviet tractors. Fifteen years have passed since then: five hundred thousand tractors, made in Stalingrad, Kharkov, Chelyabinsk and Leningrad are now working in the fields of the Soviet Union. In the great work of construction in which the whole country was engaged, Leningrad played the part of a construction laboratory.

Leningrad industry specializes in precise and delicate machine-building, electrotechnics, chemistry, and ship-building, but light industry still continues to occupy a very important position as well: the Leningrad factory "Skorokhod," for example, alone produced three times as much footwear in 1938 as all the boot-and-shoe factories of tsarist Russia taken together. Today the industrial output of Leningrad is over eleven times that of pre-revolutionary days. The proportion of Leningrad industry to that of the whole Soviet Union is very large.

Before the Revolution Leningrad industry functioned entirely on fuel brought from a great distance. Now it is creating its own base of power resources: by 1935 the town was receiving 78% of its electricity from new electric power stations worked by local sources of energy—peat and water power. Combustible schists are being mined. In 1935 Leningrad generated twenty times as much electricity as in 1919; within the last few years the output of electricity has also been increasing rapidly. By the beginning of the Second Five Year Plan over 80% of the equipment of the old Leningrad power stations consisted of plants set up in them after the Revolution. The old stations have, in fact, become new stations.

Reconstruction on such a scale is described in the USSR by the saying, "A coat has been sewn to a button."

In the Leningrad of today there are almost no industrial enterprises which are not connected with others industrially. In accordance with the national-economic plan, the works and factories of Leningrad are specialized and, by virtue of this, cooperate with each other. Leningrad represents a single industrial organism owned by one master—the Soviet State.

The Port of Leningrad is the best in the Soviet Union. Its main item of export is timber, although it receives a certain amount of industrial freight. Its work has undergone great changes. English coal is no longer imported. Industrialization has increased the proportion of industrial goods in the export trade, which has greatly expanded. All the work of the port has been mechanized.

The suburban railways of Leningrad are in process of electrification.

Leningrad is the second largest city in the USSR, Moscow being the first. Its population numbers close to three million people. The natural increase of the population is 3.5 times that of 1913. Only the center of the town had been well-planned and well-kept before the Revolution. Squalor and dirt have now been eliminated from the suburbs. Hundreds of new apartment houses have been built since the Revolution, accommodating over four hundred thousand persons. Construction is taking place mainly in the south of the town, which is safe from floods. Broad avenues are being laid and at the same time whole districts are being rebuilt.

Leningrad is second to Moscow as a cultural center of the country. It possesses many extremely valuable museums, including the famous "Hermitage" and the State Russian Museum. Former royal palaces have been converted into museums. Relics of the epoch of Peter the Great are still to be seen: for example, the small house of Peter, protected by a stone building. The Public Library of Leningrad has existed for 125 years and is one of the richest collections in the world, containing 10 million volumes. There are sixty universities in Leningrad, attended by 75,000 students (before the Revolution there were just over 10,000 students), and 142 scientific-research institutes.

The physiologist Pavlov lived and worked in Koltushi (now renamed Pavlovo), near Leningrad. The Soviet Government built a whole magnificently equipped scientific settlement for this great Russian scientist. Scientific work here has not ceased with Pavlov's death.

The Leningrad Region (55,500 sq. mi.) borders on Finland, Esthonia, and Latvia.

Smooth boulders are scattered about the fields, brought there by the ice moving down the Scandinavian mountains. There are chains of moraines—sloping hills of debris deposited by ancient glaciers. Immense fields stretch in the west—dense forests in the east. Over Leningrad blows the humid breath of the Baltic Sea.

There are many lakes in the northwest of the USSR. Of the large lakes, Lake Ilmen (355 sq. mi.) lies entirely within the borders of the Leningrad Region, and Lake Ladoga (7,000 sq. mi.), Lake Onega (3,764 sq. mi.), and Lake Peipus (1,240 sq. mi.) lie partly within its borders. The most important rivers of the region are the Neva (flowing from Lake Ladoga to the Gulf of Finland), the Svir (flowing from Lake Onega to Lake Ladoga), and the Volkhov (flowing from Lake Ilmen to Lake Ladoga). For abundance of waters the Leningrad Region, threaded by a network of lakes and rivers, occupies together with the Karelian Republic on its northern border, first place in the USSR.

Dairy cattle graze on the rich meadows of the Leningrad Region on the banks of the many rivers. The beds of kitchen-gardens may be seen near the towns, the glass of their greenhouses sparkling in their midst. The swamps are being drained. Plots of land are cleared of shrubbery and then sown with wheat—a new crop in this region. To the southwest lie the yellow and blue fields of the finest seed flax in the Soviet Union.

The soil of the Leningrad Region, from having been wasted and consumed by backward methods, has become highly productive through the use of scientific methods of agriculture. During the seventeen years prior to the Revolution the area under crop decreased by 16%; within the post-revolutionary years it increased by 50%. At the same time a large-scale industry has arisen in the Region.

Before the Revolution industry around Moscow, which developed on the basis of the labor of rural craftsmen, was represented on the map as covering a fairly wide area; but actually, Leningrad, which owed its original development entirely to its position as a seaport town, was the sole large industrial town in the Province. Within it was concentrated 90% of the textile industry of the Leningrad Province, 90% of the footwear, all of the tobacco, and all of the electrotechnical industries.

Today, in pursuance of the principle of even distribution of industry, the formerly agricultural Leningrad Region is being rapidly industrialized. New factories are springing up outside Leningrad, although at the end of the Second Five Year Plan the city of Leningrad still produced four-fifths of the industrial output of the whole region.

Aluminum, cellulose, paper, fertilizers, and wooden articles are manufactured in new works and factories in the Leningrad Region. A powerful hydro-electric station has been erected on the river Svir: the dam, by raising the level of the water, has covered the rapids and facilitates navigation. A second hydro-electric station on the Svir is in the course of construction. A hydro-electric station on the Volkhov, erected on the initiative and with the direct assistance of Lenin, is in operation: the first of Soviet hydro-electric power stations, it was built with the help of the whole country under great difficulty during the hard years of Civil War and economic collapse. Volkhovstroy, as this station is called, is regarded by everyone in the USSR with great affection as a memorial to Lenin, although the total capacity of the station (66,000 kilowatts), is equivalent only to the capacity of each of the aggregates of the Dnieper power station, and is only one-fiftieth of the capacity of the hydro-electric junction which is in the course of construction at Kuibyshev on the Volga.

KARELIA

The "Polar Arrow" express train leaves Leningrad every evening. At night the lights of Volkhovstroy shine through the dark windows of the railway carriage. The train skirts around Lake Ladoga and takes a northerly course, arriving in the morning, in Karelia.

Karelia is a land of granite, timber and many lakes. The climate is comparatively cold and damp (over 19½ inches of atmospheric precipitation) and this, in view of the slight amount of evaporation, leads to swampiness of the soil. Karelia stretches from east to west, between Finland in the west and the White Sea, the White Sea-Baltic Canal, and Lake Onega in the east. The area of the republic is 52,650 square miles.

In the south, between Lakes Ladoga and Onega, lies the principal agricultural region of Karelia. Cleared, drained, and tractor-tilled fields lie amid the forests. Clean, well-built collective-farm villages dot the countryside, with two-storied cottages whose outside window-frames are ornamented with skillfully drawn designs, true examples of folk art.

Agriculture has been transformed. The rye and potato crops have more than doubled. Thousands of acres of land have been saved from the swamps and forests by drainage and stubbing. The main forms of agriculture in Karelia are dairy farming and vegetable raising.

A broad steel-blue band stretches beyond the trees. On the horizon it is delicately outlined by the distant wooded hills. This is Lake Onega. On its shores stands Petrozavodsk, the chief town of the Karelian Autonomous Soviet Socialist Republic. Petrozavodsk possesses a machine-building industry, and wood-working and mica industries. The Karelians, who had inhabited this region from time immemorial, are an industrious people, the creators of remarkable chivalric epics, as, for example, the poem "Kalevala." Over two centuries ago Peter I made cannons of Karelian cast iron, but with the development of the metallurgy of the feudal Urals, the furnaces of the north became extinct. The Karelians caught fish, hunted animals, and sowed grain on the scanty fields which had been cleared of forests by fire. The Karelian earned ten kopecks a day at the timber works, and was so poor that he mixed barley flour with the powdered bark of trees.

The October Revolution gave the Karelians national autonomy, and since then the population has doubled. Formerly in the districts inhabited by Karelians, no more than 10% of the population was literate. Today there is no illiteracy at all.

From Petrozavodsk the railway runs in a northerly direction, crossing the whole of Karelia. The rocky hills have been polished by the heavy ice which once moved down their sides. Thickset pines grow in the furrows of the rocks. Wherever the eye turns, it meets a lake: there are something like thirty-five thousand lakes in Karelia.

Wooden stations, wooden water-towers, wooden bridges. At each large station there is a sawmill whose high iron chimney is seen far above the forest. New roads run from the station deep into the forest.

Timber forms 64% of the total industrial output of Karelia. The average productivity of labor of a woodcutter before the Revolution was from 2½ to 4 cubic yards a day. Today it is 10½ to 13 cubic yards. Stakhanovites produce 20 to 25 and more cubic yards. Formerly the timber used to be brought out in its raw state: now a wood-working industry has been created in the region. In Kondopoga (on the west shore of Lake Onega) and in Segez' (to the north of Lake Onega), cellulose and paper combines are in operation, as are a number of new sawmills. A large quantity of timber is exported.

The mining industry, in addition to the timber industry, is growing. Karelia produces building stone: granite, marble, and diabase. And since this new industry was in need of power, it was supplied by hydro-electric stations.

Beyond Medvezhegorsk, which lies on the north shore of Lake Onega amid wooded mountains, there begins the steep ascent to the watershed between the Baltic and the White Seas.

On the other side of the watershed are the Khibin mountains of the Kola Peninsula possessing immense deposits of raw material for fertilizer; also great timber, granite, and marble resources; and the fish of the Barents Sea.

Until recently there was only one way of passing through the watershed—by rail. The water trip, which was cheaper and more comfortable, entailed a sea voyage of three thousand miles around Scandinavia. It was realized that a canal passing straight through the watershed would considerably shorten the distance.

So in 1933 the Stalin White Sea-Baltic Canal was dug. The watershed was raised to a height of 354 feet, connecting the Povenets'k Bay of Lake Onega with the Sorok Bay of the White Sea.

Original hydro-technical methods were employed in the building

of the canal. It was constructed practically without the use of metal. The sluices and even the locks were skillfully made of the wood which grew on the banks. The water is held in check by earth dams which are reinforced less by concrete than by wood. The canal, 141 miles long, was constructed in record time—within the space of twenty-one months. It has 19 sluices.

Timber, apatite, and building stone are carried by the canal. The White Sea-Baltic Combinat has been erected on its banks: timber is sawn and worked up here, minerals are extracted, cattle reared, and vegetables raised. Before the construction of the canal about 53,000,000 cubic feet of timber were gathered annually in the central part of Karelia. In 1937 the White Sea-Baltic Combinat alone gathered 126,000,000 cubic feet.

The old river beds have dried up and new ones have been created in their places. The river Povenchanka no longer exists. The Lake of Vig was raised 20 feet, and scores of islands were inundated. Dams support a huge reservoir. Fishing villages have been transferred to a new shore, and the railway line has been moved back.

Both the canal and the railway emerge on the White Sea coast at one spot—at Byelomorsk (former Soroka) where an important timber-exporting seaport has come into being.

The railway line continues its northerly course, parallel to the low seashore. The forests become thinner and lower, and are more and more frequently interspersed with swamps. The train passes Kem, a timber-sawing center, and Lowkhi, where a station for the agricultural conquest of the north has been set up, crosses the Arctic Circle, and approaches the Kola Peninsula.

THE MURMAN REGION

The Murman Region (53,600 sq. mi.) lies in the Kola Peninsula. In the west it borders on Finland; in the north it is washed by the Barents Sea; in the east and south, by the White Sea. The greater part of the peninsula lies beyond the Arctic Circle, its northern end reaching a latitude of 70°.

Formerly the Kola Peninsula seemed a remote inaccessible land. This was expressed in the popular saying: "It is only a step from

Kola to Hell." Murman lay somewhere past thousands of lakes, thousands of miles away, beyond an impassable forest barrier; Murman was at the world's end. . . . In Karelian folk poetry Murman was the "land of cold," "the land of eternal gloom," "the land of shadows," "the land of sleep," the "tomb of nature."

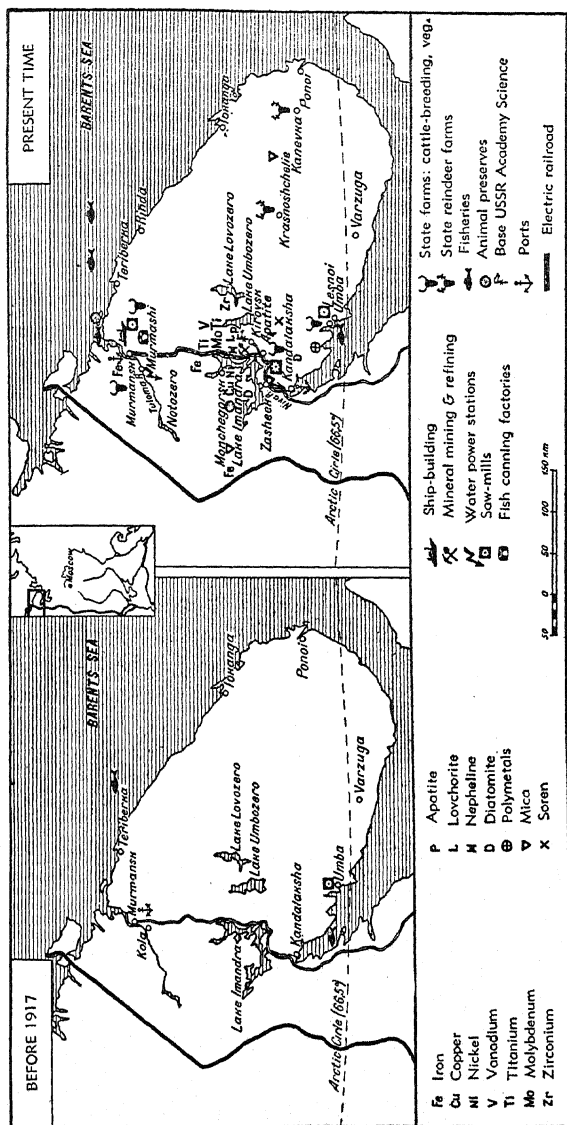
The nomadic and almost extinct Saamis (Lapps) inhabited the heart of the peninsula. They were a nation of fishermen and deer-breeders, who for a long period had to pay tribute in the form of furs and fish. Russian seashore dwellers, the so-called "Pomors," descendants of the inhabitants of Novgorod, lived on the coast. Their fishermen went out to sea in shallow flat-bottomed boats with intractable sails and snatched what they could, which was little enough, out of the stormy waves. Such huge shoals of cod and herring passed along the coasts that birds were able to stand on the backs of the fish. The mountains, which concealed millions of tons of valuable ores, were unexplored. The trees rotted and the forests were dying off. Ragged earmarks on the deer and home-made fishing tackle—such things characterized old Murman.

In 1914 the blockade during the war obliged the tsarist government to remember Murman. In order to connect with her ally, England, Russia built a railway to Kola Bay, which was warmed by the Gulf Stream and therefore never froze. The Soviet regime inherited a wasteland crossed by a single-track railway.

(See Map 17, page 115.)

Today this land is unrecognizable. The depths of the earth in this region have been explored: in the Khibin mountains alone two-thirds of all the known chemical elements in the world have been discovered; of the many minerals found here, 20 are unique in the whole world. A large-scale industry and arctic agriculture have been developed. The railway has been electrified. New towns have sprung up. In 1913 the population of the Kola Peninsula numbered 14,000 persons; in 1936 it numbered 213,000.

The railway enters the Kola Peninsula at Kandalaksha, formerly a village, now a town with a canning and woodworking industry. During the years 1926-1935 the population increased more than four-fold. Near Kandalaksha an underground hydro-electric station "Niva 3," with a capacity of 150,000 kilowatts, is in the course of



MAP 17—THE KOLA PENINSULA

construction on the river Niva. The station will stand 150 to 260 feet below the surface with water for the turbines passing along a tunnel nearly two miles long. During the Third Five Year Plan an aluminum combinat will be constructed.

The electrified railway starts at Kandalaksha, and trains run northward along the swift Niva, a river full of rapids, which never freezes even in the severest weather.

Here, beyond the Arctic Circle, there is no night for a long period during the summer. In winter the sun does not rise for weeks; barely tinging the snow-clad mountain summits at midday with its oblique rays, and leaving the valleys in a dusky twilight.

In the midst of the fir taiga at Pin Lake hydro-electric station "Niva 2" has been erected with a capacity of 60,000 kilowatts.

In the center of the Kola Peninsula lie the plateau-like Khibin mountains, with summits over 3,000 feet high. These laccolithic heights stand out sharply against the surrounding swampy and wooded country with its lakes, peat-bogs, and moraines.

Apatite, a newly prospected phosphoric raw material, is mined in the heart of the Khibin mountains, at latitude 68° N. Totalling approximately two billion tons, these are the largest apatite deposits in the world. The apatite contains as much as 40% phosphoric oxide and has over twenty uses. Superphosphates are manufactured from Khibin apatites at the chemical works of the Soviet Union. Apatite has not only made it possible to discontinue the importation of Moroccan phosphates but has itself entered the world market. Apatite not only signifies fertilizers, but phosphorus for matches and blast-furnaces; phosphorus substances for food. The apatite is mixed with nepheline, in quantities which are practically inexhaustible, having many different uses. Nepheline is used for aluminum, glass, insulators, potassium fertilizers, enamel, solid leather, non-rotting sleepers, waterproof fabrics. Other minerals are extracted besides apatite and nepheline in the Khibin mountains.

The new town of Kirovsk * has sprung up amid the rocky sum-

* Named in honor of Sergei Kirov who rendered invaluable services to the economic and cultural development of the Kola Peninsula. Kirov was the leader of the Leningrad organization of the Communist Party who was assassinated by a counter-revolutionary terrorist in 1934.

mits on the shores of the mountain lake of Vondiaavr. Ore-concentration works and electric power stations stand beside the apatite mines. The high windows of the spacious workshops shine in the polar night.

The branch line from Kirovsk joins the main line at Apatite station. The "Industry" State farm, which supplies Kirovsk with meat and vegetables, is situated here. There had been no agriculture on an industrial scale in Murman in the past. The State farm, under the severe conditions of the polar regions, obtains an average yield of 6.7 tons of potatoes per acre, and even 8.9 tons in some parts of its fields.

In the west, beyond Lake Imandra, the new town of Monchegorsk has sprung up by the new copper and nickel combinat. The first building to be erected in this town was a school. Not far away, in Chana-tundra, is the Lapland Preserve, where beavers are acclimatized and wild reindeer are kept.

The railway runs northward from Apatite station. The train passes the station of Khibini, where the well-known Khibin Experimental Agricultural Station carries on its work, the pioneer of plant cultivation in the Soviet Far North. An unpaved road leads from the station of Pul Lake to Lov Lake, the chief Saami town. In summer the Saamis used to wander from lake to lake in search of fishing-grounds, while in winter they lived in timbered villages, in huts with small hearths and windows made of scraps of glass, under roofs with holes for chimneys. Today there are deer-breeding collective farms there, a suède leather industry, hospitals, schools, new houses, and a native Saami culture.

The train descends to the deep Kola Gulf of Barents Sea through the valley of the river Kola. Under the grey sky stretch rounded mountains with patches of snow on them, sparsely covered with fir trees and birches which grow even fewer as they near the sea.

The railway terminates at Murmansk, the Arctic town situated on the coast of a fiord which never freezes. Warmed by the waters of the Gulf Stream, in January it is one degree warmer in Murmansk than in Moscow. Salt sea breezes and a smell of fish pervade the streets. There is no night in summer; at midday in winter the submerged sun glows in the south. Around the port and the great

trawler base are a refrigerator, a ship-repairing works, a canning factory, a dockyard, and an electric power station. These figures will illustrate the rate of development: in 1920—two thousand inhabitants, today—120 thousand.

The ports of Leningrad and Archangel are frozen during the winter. The port of Murmansk lies much farther to the north than they, but it is open to navigation the whole year round. Until quite recently the port of Murmansk was only a minor port. Now it has its own special importance: Khibin apatite passes through Murmansk to the markets of the world.

A hydro-electric power station has been erected on the river Tuloma, not far from Murmansk.

The aurora borealis glows continuously above Murmansk, but at times it is necessary to turn out the electric light in order to see it.

THE NORTH-EAST OF THE EUROPEAN PART OF THE RSFSR

To the east of the Leningrad Region and Karelia lie the Vologda and Archangel Regions, forming a broad even tract (about 309 sq. mi.) in the basin of the rivers flowing northwards to the White Sea: the Onega, the North Dvina, and the Mezen. The southern border of these regions corresponds approximately to the watershed between the basins of the Volga and the Arctic Ocean (of which the White Sea forms part). The Archangel Region includes the islands of the Arctic Ocean—Novaya Zemlya, Vaigach, Kolgouyev, Franz Josef Land.

The climate of the Archangel and Vologda Regions is very severe. The average annual temperature in the southwest is 35.6° F., while in the northeast it is 24.8° F. The rivers are covered with ice for two hundred days in the year.

As much as 70% of the territory of these northern regions is covered with forests; with pine forests, chiefly, in the west, and with fir in the east. There is more timber here than in Norway, Sweden, and Finland taken together, and it is of fine quality, especially in the west—fine-grained, strong, and resilient. The timber is cut, and the greater part of it exported to Western Europe through the

Port of Archangel, which lies at the mouth of the North Dvina. Since 1930 the USSR has been the foremost lumber-exporting country in the world.

In former times the best trees of the best species used to be sought and cut down, with the result that the taiga was grown over with inferior species. Destructive and indiscriminate felling has now been replaced by clear cutting, the more rational method which ensures the restoration of good timber. Formerly the timber used to be cut down only along the rivers and railways. Now the timber-cutting enterprises have been moved into the heart of the forests, forest roads being cut and small rivers utilized for timber-rafting. Rafting has been mechanized. Before the Revolution the trees were chopped down by means of axes and hand-saws; these have now been replaced by motor-saws, Canadian axes, and sleeper-cutting machines; and the Stakhanovite movement has raised the productivity of labor. For example, at the beginning of 1939 one Stakhanovite record-breaking workman, with the help of two assistants, cut down 9,460 cu. ft. of timber in one day. Work now continues the whole year round which is an innovation, and comfortable conditions for work amid pleasant surroundings have been created. In 1936 alone the wages of woodcutters in the USSR increased by 24.6 per cent and they are still rising.

Formerly the timber was carried to the rivers by horses; now it is transported along the new forest roads by motor lorries and caterpillar tractors. Before the Revolution the greater part of the timber was exported in its raw state: now there are a large number of great lumber combinats in the far north, especially at the mouths of the rivers on which logs can be floated, as at Archangel. At these new works the lumber is turned into plywood, paper, wooden pipes, insulation slabs, alcohol, resin, and other products.

Extensive, periodically flooded meadows lie along the rivers and high-quality species of dairy cattle are bred here, and butter is made. Towards the south plowed land becomes more and more frequent: flax, potatoes, barley, and, in recent years, wheat, are sown here.

In former times this was a remote out-of-the-way region, used as a place of exile. Three times Stalin was exiled by the tsarist government to Solvichegodsk, a town in this district on the river

Vichegda, in 1908-1909, 1910-1911, and 1911-1912, but each time he escaped.

The Kirov Region (about 38,600 sq. mi.) lies to the southeast of the Vologda and Archangel Regions. It is in the basin of the river Viatka, which flows south into the Kama, a left tributary of the Volga.

The Kirov Region is covered with a conifer forest, composed mainly of firs. The lumber industry is one of the principal branches of its economy, but in contrast to the Vologda and Archangel Regions, the Kirov Region does not send its lumber to the north for export, but rafts it to the Kama, and thence by the Volga to the southern regions of the Soviet Union.

Sawing and woodworking industries have sprung up at the points where the railway crosses the logging rivers, and woodworking and machine-building are developing in Kirov, the chief town in the region.

There are deposits of iron ores and phosphorites in the northeastern part of the region, in the Omutninsk district at the upper parts of the Kama and Viatka. For two hundred years small semi-handicraft metallurgical works fuelled by charcoal had been in operation near these deposits. They have now been reconstructed to manufacture high-quality metal for machine-building. The phosphorites, notable for their great phosphoric oxide content and for the low cost of their extraction, were only first utilized in the Soviet period. They are taken to Perm for manufacture into superphosphates. A new railway has been constructed in this rich land of minerals.

In the northeastern corner of the European part of the RSFSR, along the rivers Pechora and Vichegda in the midst of the woods, lies the Autonomous Soviet Socialist Republic of the Komis, whose area (144,750 sq. mi.) is greater than that of Poland. The Komi ASSR is rich in timber, coal, oil, fur-bearing animals, and fish. The winter is frosty, the summer cool.

The Komis (who were formerly known as the Ziryans) used to live in huts without chimneys, killed ermine and squirrels with firelocks, tilled the land by means of wooden plows, and harrowed it with gnarled pine trunks.

Now the Komis have their own State system. The population has become literate. A lumber industry has developed, and by 1937 timber collections had increased seven or eightfold as compared with pre-revolutionary times. The manufacture of suède from deerskin, the largest industry of its kind in the Soviet Union, has been established on industrial lines. Agriculture is mechanized and the total capacity of the tractors in operation here is approximately 7,000 h.p. Many new buildings have sprung up in the capital, Siktivkar. The area under crop has been enlarged, dairy farming is developing and deer-breeding is growing in the north. Huge outcrops of coal were discovered in the basin of the arctic river Pechora in 1923. The largest deposits of coal are situated on the banks of the river Vorkouta, a tributary of the river Oussa, which flows into the Pechora from the right. Shafts have been sunk here, and a track has been laid leading to this district. There is coal on the Pechora itself and on its right tributary, the Shchougora, and the ascertained deposits have reached tens of billions of tons. The Pechora coal fields are beginning to supply coal to the north of the European part of the RSFSR and to the marine transport of Barents Sea.

The presence of oil on the river Oukhta, in the Pechora taiga, was not unknown before, but the competition between the old and rich regions before the Revolution prevented its development. The oil magnates of Baku succeeded in putting a stop to the exploitation of the Oukhta oil fields when they had just begun.

Soviet expeditions prepared an extensive oil field on the Oukhta for exploitation and in 1931 at the point where the Oukhta flows into the Izhma (a left tributary of the Pechora), the foundations of an oil industry were laid. Derricks rose amid the firs. The new town of Chibyou was born. The industry was electrified and the manufacture of oil products was started. A motor road 186 miles long has been laid connecting the oil fields with the river Vichegda.

THE VOLGA REGION

A number of regions and autonomous republics lie to the southeast of Moscow, on the Middle and Lower Volga. Together

they form the so-called "Volga Region," over 193,000 square miles in area.

The Volga, though in places disclosing sandy shoals, is still a mighty river, the economic axis of the Volga districts. It attracts their industry, concentrating it in the towns, mainly at points of intersection with railways. It coordinates the Volga districts by means of the dense flow of goods which are exchanged between them and passed up and down the river.

At its northern end, where the Mari Autonomous Soviet Socialist Republic is situated, the Volga Region lies in a forest zone. The Chuvash Autonomous Soviet Republic, the Tatar ASSR, the Mordovian ASSR, the Kuibyshev Region, and part of the right bank of the Saratov Region, lie in the forest steppe zone, where the forest zone gradually merges into that of the steppe. The Autonomous Soviet Socialist Republic of the Volga Germans, a greater part of the Saratov Region, the Stalingrad Region, and the Kalmyk ASSR are situated in the steppe. To the south of the Stalingrad Region and the Kalmyk ASSR, near the coast of the Caspian, the steppe passes into the semi-desert zone.*

The right (west) bank of the Middle and Lower Volga is elevated. Here, from north to south, interrupted by frequent gorges, stretch the undulating Volga Hills (maximum height—1,073 feet) which end in a sheer precipice over the river. One section of them, near the town of Kuibyshev, is known as the Zhigouli Hills. The Volga skirts round them in the form of an arc, forming the Samara Bend. The left (east) bank of the Volga is low and flat, and in spring, during high-water, the meadows of the Left Volga Region are inundated.

The Volga is the longest river in Europe, about 2,309 miles in length. A third of the population of the European part of the USSR lives in the Volga basin. The Volga carries half the total freight of Soviet river transport; and if this freight traffic is expressed in ton-kilometers, it is equivalent to 70% of the freight traffic of all the

* Although the Yaroslavl, Ivanovo and Gorky Regions also lie on the Volga (at its upper end), both historically and economically they are related more closely to the so-called "old industrial center," and accordingly have already been discussed under that head. The Kalinin Region, where the Volga has its sources, is described in the chapter entitled "The West of the European part of the RSFSR."

ivers in the USSR. Timber and manufactured goods are carried southwards by the river; oil, corn, fish, and salt—northwards.

The source of the river lies in the Kalinin Region in the Valdai Hills at a distance of five miles from their highest summit—Mount Kamenik. A brook oozes out of the mire. It passes through a small chain of lakes, receives tributaries from right and left, and finally turns into a large river. Up to Kazan the Volga takes an easterly course in the main, and from Kazan turns to the south. It is joined by the Kama on the left, and the width of the Volga increases to more than a mile and a quarter, or two and a half miles including the islands. During the spring floods the river inundates a tract from $12\frac{1}{2}$ to 25 miles in width, and there have been years when the level of the Volga has risen fifty feet. As far as Stalingrad, the river is one broad ribbon of water; but after leaving that town it is broken up into the chief bed and its side channels. The channel which runs parallel to the Volga from Stalingrad right to the Caspian Sea, is called the Akhtouba. At the mouth of the Volga is a wide delta (2,500 sq. mi.) covered by a network of fairly narrow outlets. This is the only place in Europe where the lotus grows, and a reservation has been created here. The alluvia are causing the delta to increase 308 feet annually in the direction of the sea. The annual flow of the Volga totals 70,500 billion gallons.

The Volga Region (the Middle and Lower Volga) extends from north to south for nearly 930 miles, but the principal feature of its climate, its continental character, prevails over the whole length of this region. Nevertheless there is a considerable difference between the north and the south. In the north the winter lasts for five months, in the south for three. The average temperature for January in Kazan is 7.6° F.; in Astrakhan it is 19.2° F. The summer is hot, the average temperature for July in Kazan being 67.8° F.; in Astrakhan, 77.3° F. The rainfall decreases towards the south; from 16.8 inches in Kazan to $14\frac{1}{2}$ inches in Stalingrad, and 6.4 inches in Astrakhan. There is little snow, and bright sunny days are frequent.

Before the October Revolution, the Volga Region was an agricultural tract. The industry in the towns was for the most part limited to flour milling and distilleries. Now large-scale industry has been

introduced here. New enterprises such as machine building, chemical and woodworking factories have been erected, not only in the old towns but many of them in open spaces, giving rise to the development of new towns. The collective farms, with the aid of the machine and tractor stations, and the State farms, have created a scientific form of husbandry.

The Volga Region was formerly considered poor in minerals. Today deposits of minerals and fuel have been discovered on the Volga: combustible schist mainly in the Kuibyshev Region; phosphorites in the Chuvash Autonomous Soviet Socialist Republic; potassium in the Saratov Region; and sulphur in the Kuibyshev Region.

Recent years have been notable for a remarkable discovery. Long before the Revolution bituminous strata had been found on the banks of the Volga, providing the basis for the manufacture of asphalt; but all attempts to find oil on the Volga had failed. In 1929 oil was struck in Chusov Gorodki on the western slopes of the Urals, 310 miles to the east of the Volga; in 1932 it was discovered in Ishimbayev, likewise on the western slopes of the Urals. Soon a chain of new oil fields sprang up the whole length of the Ural range and these geological strata which yield oil in the Urals are present far to the west, over the whole area from the Urals to the Volga. All this section gave promise of petroleum, of which there was a sharply increased need in these districts in view of the growth of industry and the motorization of agriculture. Exploration was intensified, and as a result, oil was struck at different points of this immense territory, justifying the geological predictions of Soviet scientists. It was found in Krasnokamsk, near Perm; in Tuimaz, between the Volga and Ishimbayev; in Bugurousslan, to the north of Chkalov (formerly Orenburg), and, finally, on the Volga.

In April 1937 oil gushed out near Sizran on the Volga (in the district of the Samara Bend) from a carbon stratum lying at a depth of 3,380 feet. The daily yield was nearly fifty tons and in June a gusher was struck in the same place with a yield of over 100 tons. At the end of the year a gusher with a yield of 250 tons was struck near Stavropol, to the north of Sizran, and oil was dis-

covered in other regions along the Volga, among them Saratov. Thus conjectures concerning the oil-bearing potentialities on an industrial scale of this huge area between the Urals and the Volga have been confirmed. A new oil field has sprung up in the center of the country.

By 1937 the oil resources of the Ural-Volga region (not including the Emba district) were reckoned at over one thousand million tons, thus exceeding the ascertained oil resources of the whole of pre-revolutionary Russia. Prospecting continues.

The Ural-Volga region yielded over one million tons of oil in 1938 (4.3% of the total output of the USSR), and this is only the beginning of exploitation. At the present time this region is developing at a high rate. It has been decided to create "a second Baku" here in the shortest possible time.

The somewhat excessive sulphur content of Ural-Volga oil is compensated for by its richness in light hydrocarbon. This oil will be used, not only as a fuel, but as a raw material for various chemical industries.

The boundaries of the new Ural-Volga oil field are gradually expanding. In the east, oil has been struck on the Siberian side of the Ural range, in the Chelyabinsk Region. In the south the Ural-Volga district meets the huge Emba oil fields. In the southwest it extends towards the oil-bearing tracts of the North Caucasus. Geodetic work in the Ryazan Region in the district of the so-called Oksko-Tsninsky bank promises to extend the oil-bearing territory to the west of the Volga.

As the steamer sails down the river from Gorky, it follows the slight bends of the wide Volga, which ripples softly on its way, overtaking lumber rafts, and meeting heavy oil barges. The right bank is raised and intersected by ravines. Large collective farm villages are passed at frequent intervals; and rolling hills, covered with apple orchards, descend to the water's edge now in a gentle slope, now in a steep drop, leaving a narrow tow path along the river where fishing boats lie on the sand.

The left bank is flat, and the green plain extends unbroken to the distant horizon where in places there is a wall of forest. On the right bank, beyond the mouth of the Vetluga, which enters the

Volga from the left, stands Kozmodemiansk, a town of the Mari Autonomous Soviet Socialist Republic. Most of the Mari ASSR (9,000 square miles), which is the republic of the Maris, lies on the left bank of the Volga in a belt of pine and fir woods. Its principal industries are lumbering and woodworking. The river Vetluga, the Great and Small Kokshaga, and new forest roads are used for the transport of the timber to new sawmills and woodworking factories. Other large new woodworking and paper combinats are in operation at Lopatino near the Volga, and a leather combinat has been erected in Yourino on the Volga. Thus large scale industry has been created on the territory of a republic where before the October Revolution there were principally extremely small and barren farms. A great percentage of the population suffered from goitre then, and the cultural level of the people was very low since there were no schools in the native language.

Now there are collective farms in this region and a thousand tractors are operating in the fields. Before the Revolution there was probably not one man in the district with a university education. Today fourteen professors and 51 lecturers are employed in the universities of the republic. There are a State Theatre, a Theatre of the State and Collective Farms, and hundreds of clubs and "red corners." * The principal town of the Mari ASSR is Yoshkar-Ola, on the left bank of the Volga, connected now by railway with Kazan.

Opposite the Mari ASSR and almost entirely on the right bank of the Volga, between its tributaries the Sura and Sviyaga, lies the Chuvash Autonomous Soviet Socialist Republic (6,900 square miles). It is situated in the forest steppe zone, in hilly country cut by frequent ravines and covered with sparse forests. Chuvash oak timber is celebrated all over the country. Formerly 70 to 80% of the population suffered from trachoma and Chuvashia had the greatest number of blind people in the country. Now, treatment for this disease is compulsory and as a result it has been stamped out as a mass disease. The percentage of illiteracy was also very great among the Chuvashes—80%. Now Chuvashia is a land of complete literacy, with 39 newspapers and several magazines published in

* Red corners are the reading room and social centers set up in factories and other places of work.

this republic where there were none at all before the Revolution. A Chuvash intelligentsia has developed during the years of Soviet power. For instance, the village of Tiurlema which from the years 1867 to 1917 turned out only nine priests, three post office workers, one assistant surgeon, one road constructor, and three ensigns, since 1917 has produced nearly four hundred specialists in various fields. Among them have been twenty-two teachers, eleven engineers, three agricultural specialists, thirty Red Army commanders, four foresters, three directors of State enterprises, five land surveyors, one doctor, twenty-nine bookkeepers, and 115 mechanics.

The condition of the Chuvash village has changed as it has become more prosperous. Various large industries have been established like the woodworking combinats in Shoumerla, on the Sura, and in Kozlovsk, on the Volga. The old crops, rye and oats, have been supplemented by wheat, hemp, and potatoes. The finest motor roads in the country have been built here and are traversed by a regular bus service; and now a railway is being laid from Kanash station to Cheboksari, the capital of Chuvashia, which is a lively big town on the hills along the right bank of the river, and can be seen from the Volga steamer. The woods of this section become less dense as Tartary is approached.

The Tatar Autonomous Soviet Republic (25,900 sq. mi.) lies in the center of the Volga basin. Here the Viatka and the Belaya flow into the Kama, and the Kama into the Volga.

The Tatar ASSR is situated in the intermediary zone between forest and the steppe. Podzol soils are gradually replaced by black soil, and dense conifer forests are succeeded by sparse oaks.

The Tatar Republic, created in accordance with the nationality of its inhabitants, occupies in the main the territory of the former Province of Kazan. Before the October Revolution small factories in Kazan manufactured boots, candles, and soap, but not of local raw materials. Tallow was brought from Siberia, tans came from Japan. This represented practically the whole industry of the section. Four-fifths of the products of the former Kazan Province were supplied by agriculture.

In Soviet Tartary, industrial output has increased sevenfold. A new fur combinat in Kazan dresses nearly half of the pelts

obtained in the Soviet forests. The old soap works have been reconstructed, and are now one of the most important enterprises in the oil and chemical industry of the country. Throughout the section are new condensed milk plants, new factories for the manufacture of felt boots, for preparation of lumber, for manufacture of asphalt from oily bitumens, for the building of ships in the back waters of the Kama and the Volga where there were formerly only ship repair yards. A small typewriter shop in Kazan has been transformed into a great works producing typewriters for the peoples of the Soviet East; and a new thermic and electric station, a large synthetic rubber works, and a large cinema film factory have been erected. Before the Revolution encyclopedias used to state: "Of the very scant natural resources of the Kazan Province, of chief importance is the clay which is used in the manufacture of pottery." The fields were covered with boundary lines dividing them into narrow strips; and against 83,000 real plows there were 291,000 "*sokhas*" or ancient wooden plows. The soil had been ruined by the three-field system; grain stalks were interspersed with weeds, and there was the constant threat of the inevitable drought. On a hundred peasant farms, 25 possessed no horse, and 5 possessed neither horse nor land. A third of the adult male population of Tartary went away to seek a living elsewhere, and, as one writer said of the peasants of Kazan Province there was "Restricted means of gaining a livelihood and, correspondingly, a restricted increase in the population."

Tartary has now become a country of collective and State farms. It possesses over 40,000 tractors and close to 1,500 combine harvesters. In 1937 the average output per tractor was twice the average figure for the whole of the Soviet Union. The area under crop in the collective and State farms increased by 50%: before the Revolution it was diminishing. The predominance of the "grey grains" is becoming a thing of the past. The proportion of new crops—leguminous plants, sunflowers, wheat, fodder grasses, and potatoes is increasing. The "dumping grounds" on the banks of the river have been transformed into gardens. Hundreds of dairy farms have been established. There was only one university in Kazan before the Revolution. There are now eleven in Tartary. In 1913, 310,000 rubles

were assigned to education; in 1937, 160,000,000 rubles, five hundred times as much, were assigned to the same purpose. Kazan, the capital of Soviet Tartary, and one of the most important scientific centers of the USSR, is a great industrial city. The steamer does not come close to Kazan, for the town stands on the left bank at a short distance from the river. The water will reach its walls only when the Kuibyshev dam has been constructed and raised the level of the Volga. From the river one can see the streets and houses of the town on the hills, with the silhouette of its kremlin and of ancient pointed towers.

At Kazan the Volga turns sharply to the south and soon the steamer arrives at the point where the Volga and Kama meet. To the right is the wharf for Kama and Volga freight; to the left, the wide mouth of the Kama. The Volga becomes wider; its water, here mixed with that of the Kama, is darker.

The Mordovian Autonomous Soviet Socialist Republic (9,850 sq. mi.) lies not on the Volga itself, but to its west—on the Moksha (a tributary of the Oka), and the Sura (a tributary of the Volga), along the Moscow-Kuibyshev railway, and in the belt of black soil forest steppe. This is the home of the Mordovian people, who are divided into two branches—the Moksheas and the Erzyas. The capital of the republic is Saransk.

The smallest harvests in the whole of tsarist Russia used to be gathered in Mordovia. Now, fifteen hundred collective farms, equipped with modern machinery, have transformed agriculture, and have introduced wheat and crops such as hemp, potatoes and flax. Starch works, hemp combinats, and other industrial enterprises have developed on the basis of these crops; and the lumber industry is also developing, mainly in the western part of the republic. From 1933 to 1937, the industrial output of the republic increased nearly fivefold. The culture of the Mordovian village is advancing. Before the Revolution, for example, only two copies of the local newspaper were received in the village of Old Naiman, for the priest and the teacher. Today the collective farmers of this village subscribe to 400 copies of the paper.

The Volga steamer on its journey crosses the Kuibyshev Region with its great food and metal-working industries. Mechanized agri-

culture is waging a successful battle here, as in the other districts of the southern Volga Region, against the drought. Attractive hills continue to line the right bank, and on the left is the same boundless plain. Lenin was born in Oulianovsk (former Simbirsk) in the Kuibyshev Region, and there spent his childhood.

An oil industry has been created in Stavropol. A little to the north of Kuibyshev (former Samara), at the Samara Bend, a huge hydro-electric station is in the course of construction. In Kuibyshev itself there are large elevators, mills, and machine building works. In Sizran, combustible schists and oil are extracted.

The leafy forests now become thinner along the river, and the air becomes dryer as the Volga enters the steppe zone.

This is the Saratov Region. The immense fields are sown with extremely valuable hard wheat; sunflowers occupy a large area. In the Bekov district on the right bank, sugar beet is being sown for the first time; also there are many melons here. In Saratov there is an oil distillery, the largest combine harvester works in Europe, and a huge ball-bearing works in the course of construction. The town lies in a large hollow on the right bank, surrounded by green chalk hills, and one can see the buildings of the new plant from the river. Below Saratov is a new bridge across the Volga, one of the largest in the USSR, connecting the Lower Left Volga Region with the center of the country.

Opposite Saratov, on the left bank of the Volga, is the town of Engels (former Pokrovsk), the capital of the Volga German Autonomous Soviet Socialist Republic (10,900 sq. mi.). The Republic lies on both banks of the river, but the right bank is less subject to drought than the left and therefore more densely populated. The German colonists came here from Germany in the 18th century on the invitation of Catherine II who helped to consolidate this zone, which was a frontier at that time, by means of agricultural colonization.

The ASSR of the Volga Germans is one of the most advanced Soviet republics. Agriculture has reached a very high level, collectivization has been achieved here one hundred percent, and the most up-to-date agricultural machinery is used. The chief crops are hard wheat, sunflowers and mustard; and meat cattle are bred. The

old food and textile industries of this section have been reconstructed and enlarged, and new branches of industry have been created such as machine building and lumber milling. In Engels a huge meat combinat, including a tannery and a boneworks, has been constructed.

During the past twelve years eighteen large enterprises have been erected in the republic, and industrial output has increased fifteen-fold. Several universities and technical schools have been created. Twenty newspapers are published and there are two German theatres.

The Volga enters the Stalingrad Region, and here the river flows below ocean level, and its current becomes sluggish. The main bed of the river is accompanied by numerous side-channels. The last coves disappear. The air is dry and hot. The black soil is replaced by brown soil. Patches of salt-marsh and sand begin to appear. There are fewer and fewer plowed fields. Extensive pastures stretch into the distance, and the right bank becomes increasingly lower.

A marvelous panorama of Stalingrad opens up on the right as the steamer passes down the river. For 31 miles there stretch in unbroken succession a tractor and metallurgical works, a canning factory, an oil-distillery, sawmills, an electric power station, wharves, warehouses, new dwelling houses, and shipbuilding yards. In 1920 in Tsaritsin (as Stalingrad was formerly called), there were 90,000 inhabitants: now in Stalingrad there are close to half a million.

The city lies at the spot where the Volga approaches the Don. The construction of a canal, 60 miles long, which would connect the Volga and the Don is at present under consideration. The Volga, which flows into the closed-up Caspian Sea, will have an outlet to the open Black Sea, and the Volga region will thus be brought into close connection with the Donetz Coal Basin. Donetz coal will be brought by cheap water transport to the Volga and will then be distributed over the Volga Region. The lumber which at present is shipped from the Volga to the Donetz Coal Basin is transferred at Stalingrad from the river to the railway. In the future it will continue its journey along the canal instead.

The Volga, at this point a broad, full expanse of water, enters the

hot Caspian Sea, the land of salt and fish. Salt is extracted from the lake of Baskouchak, which is connected by rail with Vladimirovka wharf on the Akhtouba, a side channel of the Volga. This is one of the richest fishing regions in the world. Vobla (a variety of shad), pike, carp, sturgeon, and herring are caught in the shallow northern part of the Caspian, which is the home of 32 different species of valuable fish. Fish products are manufactured in the Astrakhan district, situated in the Volga delta. Within recent years, the fry of some species of fish, the grey mullet for example, have been brought by airplane from the Black Sea to the Caspian.

For the first time, serious development has begun in the region of fertile silty soils lying on the banks of the Lower Volga, the region known as the Volga-Akhtoubinsk region of flooded meadows. Cotton, grapes, and other valuable plants are now being grown there.

The Kalmyk Autonomous Soviet Socialist Republic (29,700 square miles) is situated on the Lower Volga, on the dry plains of the right bank, a region of hot summers and cold winters. To the west stretches a chain of low hills, the Ergeni Heights.

The Kalmyks are a people of Mongol origin, who migrated here from Central Asia in the 17th century. They were a nation of nomads. Half of the cattle belonged to the kulaks and aristocracy, who numbered only 6% of the population, and seventy-five per cent of the people possessed no cattle at all. The Kalmyks were burdened by a parasitic class of Buddhist priests: there was one lama for every sixty-six persons. "The whole past of your people was one endless chain of suffering," wrote Lenin in an address to the Kalmyks.

The State is aiding the settlement of the nomads in Soviet Kalmykia, with a view to accelerating the development of their economy and culture. The great majority of the Kalmyks have already begun to lead a settled life. The cattle is the property of the collective farms and State farms.

Stocks of fodder are laid in for the winter with the aid of mechanized-mowing, and the help of machine and tractor stations. Warm cattle sheds are being built, and the number of cattle has almost doubled during the Second Five Year Plan in Kalmykia.

Fishing is developing on the sea-coast and industry has made its

first appearance; for example, a huge fish-canning works has been erected in Lagan on the Caspian coast.

During the twenty years preceding the Revolution, the population had decreased by 15%, while between 1917-1933 it increased by 33%.

There had never been any towns in nomadic Kalmykia. Today the newly built town of Elista, the capital of the republic stands in the steppe, connected with neighboring regions by regular motor and air services.

THE FIGHT AGAINST DROUGHTS

Of no mean importance in the national economy of the Volga Region is the fight against droughts. Russia's everlasting misfortune were the general droughts which recurred all over the country every few years, and the partial droughts which occurred in various regions every year. In tsarist Russia these meant the destruction of grain, widespread famine, millions of deaths. Unstable harvests were a constant menace to national economy.

In 1891, 1904, 1911, and 1921 the drought in the Volga Region was so extensive that nearly the whole harvest was lost. The soil became dry and the air too. A haze of hot particles of dust rose and covered everything, including the face of the sun, and soon the ears of grain were parched and useless. The old strip method of peasant farming, customary in tsarist days, was defenceless against droughts. They had to be fought in a battle against the elements, and this was beyond the power of the small peasantry. A struggle such as this had to be carried on, not as an isolated undertaking in different districts, but in accordance with a single plan over an immense territory. Only the unified Socialist State, with the support of the collective farm peasantry, was able to start a successful fight against drought, the ever-recurring natural calamity.

The collective farms, with the aid of machine and tractor stations, apply the most up-to-date methods of agriculture in the Volga Region. Government decrees have made it compulsory, in the drought regions, to plow the soil to a depth of no less than 8 to

9 inches, to cultivate the land in autumn, and so on. Exact limited periods for doing the various phases of agricultural work have been established by law, for one day's delay might result in disastrous losses. The drought regions are supplied with a greater quantity of fertilizers and a larger number of agricultural machines. Scientific crop-rotation has been introduced, and the area under winter crops is extended. Drought-resisting crops are planted, such as millet, yellow alfalfa, and others. New kinds of drought-resisting wheat are sown. Winter seeds are turned into spring seeds. Snow is kept lying on the fields over thousands of acres with the aid of screens and scattered brushwood which prevent the snow from melting early in spring and retain the moisture in the fields.

The reforestation of belts alongside the fields is being carried out over a huge tract in the south-east—from the Sea of Azov to the spurs of the Urals. The trees—acacias, maples, ashes—which are planted in the treeless steppes, protect the fields from dry and hot winds and delay the thawing of the snow. During the period of the Second Five Year Plan 840,000 acres of these protective forests were planted in the southeast. There will soon be tracts of unbroken forestlands on the watersheds of the steppe rivers and the fields of collective and State farms will be covered by a close network of forest strips, of "wind-breakers."

The collective farms of the Left Volga Region dam up the local streams—the Kinel, the Solianka, and others—and lead their waters into the fields. Dry or swampy ditches are dammed up by dikes and turned into ponds in spring, and the water collected in these reservoirs is valuable not only as a source of the immediate irrigation of the fields but simultaneously increases the humidity of the air and the local condensation of moisture, namely, the rainfall. The building of complex construction for collective farm irrigation systems and the salaries of the chief engineers and other necessary personnel are provided for by the State budget. Close to 250,000 acres of collective-farm lands to be sown with wheat, potatoes, and vegetables, will be irrigated in the Left Volga Region in 1939. Wind-motors will be used for driving the water over the fields. It has already been observed that spring flooding of the streams in the

Left Volga Region has almost ceased since the water has been kept in reserve by dams for the purpose of irrigating the crops.

A special magazine popularizing methods of fighting drought is published in Saratov for the collective farmers. All this coordinated work has produced marked results: the soil in the drought zone is yielding higher crops than formerly. For example, 1938 was a very dry year; yet the collective and State farms in the drought regions reaped a harvest forty to fifty per cent greater in that year than the annual harvests used to be before the Revolution.

The entire elimination of drought, however, will be accomplished with the completion of the vast work of irrigating the Left Volga Region by means of Volga water, a basic part of the plan for general reconstruction of the Volga.

THE RECONSTRUCTION OF THE VOLGA

The unbroken stretches of the Volga are very deep but shoals and sandbanks render this depth valueless. In the spring the snow in the forests that were so ruthlessly thinned out in the decades before the Revolution, thaws and rushes into the Volga, causing widespread floods. The spring flow of the Volga basin is equivalent to 70% of the annual flow, and in summer the Volga becomes shallow. There is a high percentage of "hard flow" in the Volga, its water carrying a large amount of silt. As the Volga deposits its alluvium, its channel shifts. The mighty river passes through industrial districts but supplies them with no energy. It passes through the zone of drought but gives the fields not a drop of its water. The Volga must be thoroughly reconstructed, and this work has already begun. It was preceded by extensive scientific work carried out by the Academy of Sciences of the USSR and other scientific institutions, and investigation still continues. Under the system of planned economy, the reconstruction of the Volga signified the planned and scientific reconstruction of the whole economy of a huge territory.

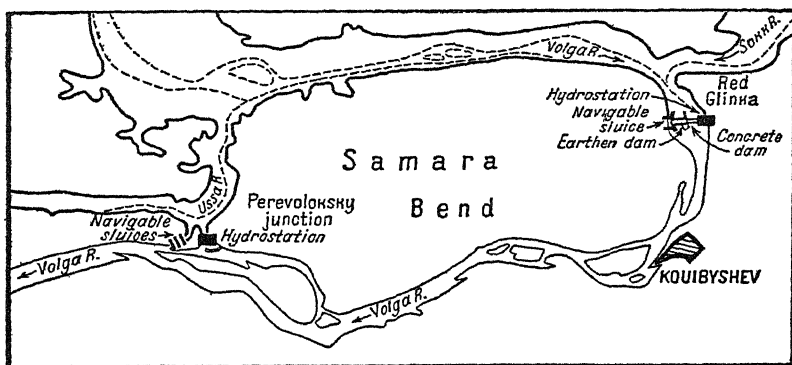
A number of powerful hydro-electric stations on the Volga were planned, of which one has already been completed and three are now in process of construction: at Ivankovo (already finished),

Ouglich (under construction), Ribinsk (under construction), Chkalovsk, Cheboksari, Kuibyshev (under construction), Kamishin, and Cherni Yar. Other hydro-electric stations will be erected on the tributaries of the Volga, the Kama and Oka, of which the first will be built on the Kama at Solikamsk (under construction), and the other on the Oka at Kaluga. The total capacity of all these structures will reach a figure in the neighborhood of 10 to 11 million kilowatts. The raised level of the water will extend from one dam to the other, transforming the Volga into a number of immense lake reservoirs such as already exist on the map (the "Sea of Moscow" reservoir, 290,620 million gallons in volume) at the beginning of the Moscow-Volga Canal. There will soon be another huge reservoir at Ribinsk (605 billion gallons).

The depth of the river will not only be increased because the level of the water is raised by the dams of the electric stations, but the dams will also serve to confine water in spring and release it in summer, when the river becomes shallow, evenly distributing it over the whole course of the Volga. At the end of the Third Five Year Plan the channel depth of the river will increase to no less than 8 feet, and subsequently, when the whole work of reconstruction has been terminated, to 16 to 20 feet. (See Map 3, page 12.)

In the eastern part of the Samara Bend (a bend of the Volga towards Kuibyshev), the Kuibyshev hydro-electric junction is in course of construction. This will be the largest hydro-technical structure in the world, with a capacity of 3,400,000 kilowatts. The largest of these hydro-stations now being built—the Grand Coulee dam in the United States—has 1,900,000 kilowatts. The junction will consist of two hydro-electric stations; one (the larger) will be on the Volga, and the other at the end of the derivation canal which will be cut at the base of the Bend and will straighten out the Volga. The amount of concrete work will be four times more and that of rock explosion seven to eight times more than during the construction of the largest American hydro-station, Boulder Dam. The amount of electricity generated by the junction will be slightly less than that generated in the whole of France, almost as much as that generated by Italy, and seven times as much as was generated

in the whole of Russia before the Revolution. The dam on the Volga will be approximately 2 miles long and will raise the water 105 feet. The force of the water will drive turbines with a capacity of 200,000 kilowatts, thus exceeding the force of the largest Soviet and American turbines. The wheels of these will be more than 32.8 feet in diameter. The new reservoir (10,568 million gallons in volume) will form a lake of 2,700 square miles. Many villages will be transferred to new sites. The hydro-junction can be seen on map 18 below.



MAP 18—KUIBYSHEV HYDRO-GRID

Part of the cheap electricity of the Kuibyshev junction will be transmitted by high-tension wires over huge distances, to Moscow, Gorky, and the Urals. Its advantages will not only consist in the fact that power will be distributed among the most important industrial regions of the country, but also in the fact that the inclusion of thermic and hydraulic stations in one great system will do away with the unfavorable influence of the somewhat seasonal character of the work of these stations. Besides, as is well known, the most expensive energy is generated in the evening peak hours. There is a difference of two hours between Moscow and Ural time, two regions which are 930 miles apart but which will be included in one system. Consequently it will be possible to effect a more even and a cheaper distribution of peak electric power.

Part of the electric power will be transmitted to new enterprises to be constructed in the Left Volga Region. In this case the advantages of planned economy are manifested in the fact that the consumption of electric power will occur at the very moment when the hydro-electric stations have been erected and are able to operate at full capacity.

Part of the electricity will be used to effect the extensive irrigation of the Left Volga Region. Powerful electric pumps will drive the water of the Volga over the fields affected by periodic drought. During the whole year water will be pumped into huge reservoirs constructed at the upper parts of local rivers. In summer the Volga water collected in the reservoirs will be sent through channels to irrigate the fields lying on the left bank of the Volga from Kuibyshev to Kamishin. The total area to be irrigated in the Left Volga Region will be nearly ten million acres. This will nearly equal the total area of all land irrigated in tsarist Russia. Eventually the Left Volga Region, irrespective of climatic conditions, will be yielding stable wheat harvests every year. Cattle-breeding will be developed on the watered lands.

The reconstruction of the Volga is a complex process. It will not only become a source of electric power but also a magnificent waterway and the means of irrigating immense tracts which today are dry. The accomplishment of this great and complex work of construction is facilitated by the fact that all branches of national economy in the USSR develop in accordance with a common plan.

The creation of immense reservoirs on the Volga and the use of Volga water in the irrigation of huge territories in the Left Volga Region might lead to a drop in the water level on the coasts of the Caspian Sea. This cannot be allowed to happen because it would mean the destruction of the fish besides rendering the wharves in the various ports useless with a consequent obstruction of transport. Also it would increase the dryness of the climate; so the Volga must find other sources of water supply, which may be done by two methods. As part of the construction of the Volga-Don Canal, the River Don, at its point nearest the Volga (near the town of Kalach), will be dammed up and raised to such a level that part of the water will be forced to pass along the canal through the

watershed in the direction of Stalingrad. Here the water will fall into the Volga by means of a 253-foot drop, since the level of the Volga is lower than the Don. A hydro-electric station is supposed to be constructed at this waterfall. A large part of the arid steppes of Kalmykia will be irrigated; and the Sea of Azov will be in no danger of growing shallow as the result of this transference of part of the Don waters to the Volga because it is connected with the Black Sea by way of the Kerch Straits.

The flow of the Volga, and hence the water resources of the Caspian Sea, may also be increased by means of the transference to the south of part of the flow of the full rivers of the north which fall into the Arctic Ocean—the Pechora and Vichegda. The upper parts of these rivers and of the Kama (a tributary of the Volga) will be joined by one huge reservoir with hydro-electric stations, which will be situated to the north of Solikamsk (in the North Urals). The regulation of the flow of this reservoir will make it a simple matter to transfer part of the waters of the Pechora and Vichegda to the Kama, namely, to the Caspian Sea.

Thus the country has undertaken the task of redistributing its waters among the basins of its different seas.

THE LOWER DON AND THE NORTH CAUCASUS

On the lower reaches of the River Don, which falls into the Sea of Azov, lies the Rostov Region (38,880 sq. mi.). On the River Kuban, which also falls into the Sea of Azov, and on the north-eastern part of the Black Sea coast, is the Krasnodar Territory (31,460 sq. mi.). These two regions form the South of the RSFSR, from 50° to 43° N. Black soil steppes stretch to the horizon. The warm climate is eminently favorable to agriculture, though somewhat less so in the east where there is a scarcity of rainfall. In Rostov the average temperature for July is 74.7° F. and for January 21° F. Atmospheric precipitation amounts to 18 inches. In Krasnodar (former Ekaterinodar) the corresponding figures are 74.7° F., 28.2° F., and 25.2 inches. In the south, tower the snowclad summits of the Caucasian mountains, with their thickly wooded slopes and mountain valleys where rapid rivers rush tempestuously.

The first Russians to settle in these regions were the Don and Kuban Cossacks, while Terek Cossacks settled in the east, within the bounds of the present-day Orjonikidze Territory. The Cossacks had been engaged in military service from time immemorial. There were almost no great landowners; agricultural products were easily marketed, and machine mowers, threshers, and other implements were used to a considerable extent.

Today the Cossacks have united in collective farms. On the Don and Kuban over 25,000 tractors and 7,000 harvester combines are in operation. Large-scale State farms have been organized and there are many millionaire collective farms, meaning collective farms whose total income amounts to one million rubles and over.

Special Cossack units are included in the Red Army, one of them being a cavalry unit distinguished for its brilliant military talent and exceptional fighting ability.

Boundless wheatfields stretch in the Don steppes (in the north) and Salsk steppes (in the east) of the Rostov Region. Large areas are planted with sunflowers (for their oil). Vegetable gardening has developed in the proximity of the industrial centers. Formerly, the Donetz Coal Basin used to get its vegetables from outside: now it raises its own vegetables. The vineyards on the sandy banks of the River Don are being extended.

On the Kuban in the Krasnodar Territory, immense level fields growing wheat, barley, and maize, alternate with melon and tobacco plantations, and fields of sunflowers and crops which are new to the region—cotton, soy beans, castor-oil plants, and kenaf. The low and swampy tracts along the Kuban are being drained. Thousands of acres of land, formerly malarial and barren, have been reclaimed and sown with rice, a crop almost new to the region. Cattle-raising is developing, especially in the arid east where pastures form a large part of the territory.

Sub-tropical plants, such as ether-producing plants, and valuable fruits, are cultivated on the Black Sea coast round about Sochi, one of the finest health resorts in the USSR, where there is practically no winter. The average temperature for July is 72.1° F.; for January it is 41.5° F.; atmospheric precipitation amounts to 55.6 inches.

A food industry has grown up based on the agricultural produce

of the region, including the manufacture of vegetable oils and food-canning. A tobacco industry has also sprung up.

Heavy industry has developed as well. A new agricultural machinery factory in Rostov has a larger output than all the similar factories of tsarist Russia taken together. The Rostov Region produces over 12% of the coal of the Donetz Coal Basin, the eastern end of the Basin, rich in anthracite, forming part of the Region. Prospecting within the last few years has revealed that the anthracite deposits stretch in an easterly direction far beyond the established limits of the Donetz Coal Basin right to the banks of the Don.

Oil is extracted in the Krasnodar Territory, at the foot of the Causasus, chiefly at Neftegorsk near Maikop, and it is refined at Krasnodar. Within twenty years the output of oil here has increased thirty times.

From the Sea of Azov to the Caspian stretches the Manich Hollow, a narrow valley with a chain of lakes and streams that dry up in summer. During the Quaternary Period a strait passed here connecting the Caspian Sea with the Sea of Azov. A few years ago the Manich waterway, over 186 miles in length, was laid in the Hollow along the course of the River Manich from the Don to the village of Divnoye. The Salsk steppes, the region of the Giant State Farm, were provided with a watercourse to Rostov, and now in the dry tracts of steppe land are lakes in which as much as 4,840,000 pounds of pike, carp and bream are caught. There is not enough water in the Manich, while in spring there is too much in the Kuban which lies 124 miles away, so now a canal is being constructed which will transfer part of the waters of the Kuban to the Manich. The water will be collected by a dam at Nevinnomisskaya and directed towards the north through the canal which will intersect the watershed elevation by means of a tunnel at a depth of 165 to 200 feet. The canal will terminate at the river Verkhny Yegorlik, a tributary of the Manich. In addition to effecting the transference of the waters of one river basin to another, the canal will irrigate 2,500,000 acres of land. Eventually the Manich waterway will be extended to the Caspian Sea, 390 miles away. Its level will be maintained by means of a special canal with water from the Terek, a

river 124 miles away to the south flowing into the Caspian Sea. The canal from the Terek will at the same time serve to irrigate a large expanse of steppe land and to generate water power. Important ports which do not freeze in winter lie on the Black Sea in the Krasnodar Territory: Novorossisk, which exports grain, and cement from the largest cement works of the USSR; and Tuapse, which is connected by pipe lines with the oil fields of Grozny and which exports petroleum.

The Adighey Autonomous Region forms part of the Krasnodar Territory and is the home of one of the peoples of the Caucasus, the Adighes. Wheat, tobacco, and sunflowers are cultivated here; thoroughbred Kabardinian horses are raised; and a wood-working industry has been created. A "Preserve" of 875,000 acres lies on the slopes of the Caucasus at a height of 9,500 feet, and here there are aurochs—which exist nowhere else in the world—and also wild goats and Caucasian deer. In the mountains there are glaciers; and in the valleys, forests of spruce, yews and chestnuts.

On the eastern side of the watershed between the Black and Caspian Seas lies the Orjonikidze Territory (39,200 square miles). Its chief town is Voroshilovsk. In the west of the Territory is the Stavropol Plateau (at a height of 2,460 feet), and in the east are the Caspian lowlands. The temperature for July in Voroshilovsk (the western part of the Territory) is 69° F.; for January it is 23.7° F.; atmospheric precipitation amounts to 25 inches. In Kizliar (the eastern part of the Territory) the corresponding figures are 75.7° F., 27.5° F.; and 11.2 inches. In the south the Territory borders on the Caucasian range.

There is an abundance of sun and of fertile soils, both black and brown, in the dry steppes. The collective farms and State farms carry on a planned campaign against drought, and obtain heavy crops of wheat and barley from their fields. Sheep, bred both for their wool and their meat, graze on the extensive pastures. Orchards, and melon and rice plantations, have been planted along the rivers on the irrigated tracts. In the towns, industry has been developed, based on the produce of agriculture and cattle breeding. On the slopes of the Caucasus (at a height of 1,703 to 2,713 feet) within the boundaries of the Territory, lies Piatigorye—a group

of health resorts with medicinal mineral springs including Kislovodsk, Piatigorsk, Essentuki, Zheleznovodsk, and others.

The Orjonikidze Territory includes the Karachay and Circassian Autonomous Regions. The Karachay Region lies on the upper reaches of the Kuban and its tributaries. At the eastern boundary of Karachay towers the two-headed snow-capped Elbrus, the highest summit of the Caucasus (18,468 feet above sea level). Lumber milling has been established in Karachay, and coal and gold are mined here. Before the Revolution the inhabitants of Karachay did not have a single town, but now there is a new town, Mikoyan-Shakhar, which has been built in the mountains at the point where the Teberda flows into the Kuban. It has five thousand inhabitants, various cultural institutions, and the streets are paved with asphalt. From Karachay to the Transcaucasus, through the health resort of Teberda, over the snow-covered Kloukhar Pass, and through dense mountain forests, runs the Military Sukhumi Road, one of the most picturesque mountain roads in the Caucasus.

On the lower reaches of the Kuban, in the almost treeless rolling foot-hills, lies the Circassian Autonomous Region, with its horticulture, wheat and sunflower fields, and industry based on its agricultural produce.

THE REPUBLICS OF THE NORTH CAUCASUS

The mountain peoples of the North Caucasus have formed several Autonomous Soviet Socialist Republics. These republics, which are adjacent to each other, lie on the northern slopes of the range—from Mount Elbrus to the Caspian Sea. The common characteristic of their position is that, descending from the ridge of the Caucasus to its foot, they consist of a mountainous and generally wooded region and a treeless plain.

To the north of the center of the Caucasian range, in the basin of the left tributaries of the Terek—the Malka, Baxan and Chegem—lies the Kabardino-Balkarian Autonomous Soviet Socialist Republic (4,750 sq. mi).

Balkarians live in the mountains. Cattle-breeding is developing on the Alpine pastures. New molybdenum mines are being worked.

A hydro-electric station has been erected on the river Baxan which supplies power to the electrified railway from Mineralnye Vody to Kislovodsk.

At the foot of the mountains lies the Kabardinian plain with its fertile black soils, extensive fields of wheat, maize, and sunflowers, many orchards and gardens, and new irrigation canals. The plain is more densely populated than the mountains, the population consisting mainly of Kabardinians.

The agriculture of Kabardino-Balkaria is marked by a high level of technique and production. During the years of collectivization, the area under crop tripled. The fields yield heavy crops; many poultry and cattle-breeding farms have sprung up; and by 1936 the collective farmers were receiving for each labor day—in addition to money—vegetables, meat, butter, potatoes, and as much as 45 lbs. of grain.

The Kabardinians and Balkarians now have their own written language, which they never had before the Revolution. There are universities in Nalchik, the capital of the republic; and whereas in tsarist times only 3.4% of the Kabardinians were literate, and 1.4% of the Balkarians, now illiteracy has been wiped out altogether. The collective farms are rebuilding their villages, according to the designs of the best architects of the country. Their careful plans include such features as two-storied buildings, paved roadways, green boulevards, cultural and communal institutions: clubs, schools, dispensaries, homes for the aged. The collective farmers are moving from their low, stuffy, and dark huts to new spacious houses surrounded by orchards and provided with electricity and radio.

On the same northern slope of the Caucasian range, by the river Terek which flows down the mountainside, lies the North Ossetian Autonomous Soviet Socialist Republic (2,400 sq. mi.). The northern plains are the most densely populated parts of the republic, and here an advanced form of agriculture and a food industry have developed. In Besslan, a starch and molasses combinat has been erected which is of importance for the whole of the Soviet Union since it is the first plant in the country to manufacture starch and

molasses from corn instead of potatoes. In the mountainous part of the republic, lumbering and cattle breeding are carried on.

The chief town of North Ossetia is Orjonikidze (former Vladikavkaz). Lead and zinc are mined here. Non-ferrous metallurgy gets its power from a new hydro-electric power station erected on the river Ghizeldon (a tributary of the Terek). The water flows through the turbines of this station from a height of 1,033 feet.

A motor road, the so-called Military Georgian Road, runs southwards from Orjonikidze over the Krestovy Pass of the Caucasian range to Tbilisi.

To the east of the North Ossetian ASSR lies the Checheno-Ingush Autonomous Soviet Socialist Republic (6,060 sq. miles). The west of the republic is inhabited by Ingushes, the east by Chechens.

The main industry of the Checheno-Ingush ASSR is oil-extraction, around Grozny. For its oil output, which has increased nearly threefold within twenty years, Grozny is second only to Baku; in benzine content its oil surpasses Baku oil. Large oil refineries operate in Grozny, and pipe-lines have been laid to Tuapse on the Black Sea, to Makhach-Kala on the Caspian Sea, and to the Donetsk Coal Basin. A machine-building industry has been created as an auxiliary to the oil industry.

Lands under crop and harvests have increased. The State farms and collective farms plant corn, wheat, and fodder grasses, and new crops as well such as soy beans and cotton. Orchards are extensively cultivated.

Prior to the Revolution there had been no literature in the Chechen and Ingush languages. In 1936 alone 637,000 copies of books were published in Checheno-Ingushetia.

Thousands of mountain dwellers have left their uncomfortable barren ravines for the fertile plains.

The Daghestan Autonomous Soviet Socialist Republic (13,100 sq. mi.) lies in the eastern part of the northern slopes of the Caucasian range. In the north the republic is bounded by the Terek, in the east by the Caspian Sea. The mountainous part of Daghestan is treeless. The national composition of the population is extremely diverse. A comparatively small territory is inhabited by over thirty

peoples, including Avars, Lezghins, Andians, Laks, and others. Before the present construction of roads had begun the mountains of Daghestan were difficult of access. Industries such as cattle-breeding and handicraft industries have developed in these mountains and now the utilization of "white coal" (water power) has begun.

Apple and cherry orchards occupy a large tract in the foothills and around them a fruit-canning industry has been developed.

Corn, wheat, and cotton—the last a new crop in the region—are sown on the irrigated fields of the lowlands.

The presence of natural gases and quartz sands near Derbent on the coast of the Caspian Sea has made possible the manufacture of glass here. Makhach-Kala, the capital of the republic, which is connected with Grozny by means of a pipe line, has an oil-refining industry, and also a fish-canning industry. Oil is extracted at Izberbash on the seashore.

THE CRIMEA

A quadrangular piece of dry land, joined to the mainland by the narrow isthmus of Perekop, juts into the Black Sea. This is the Crimean Peninsula, the territory of the Crimean Autonomous Soviet Socialist Republic (10,100 sq. mi.). Its peninsular position makes easy maritime connections with other regions. The Crimea is inhabited by Crimean Tatars, Russians, Ukrainians, Armenians, Greeks, Jews, and other peoples.

The history of the Crimea was a very stormy one. Here the steppes of Eastern Europe came into contact with the seas of the Mediterranean basin. Streams of raw materials met streams of textiles and metal wares in the Crimea. Scythians, Goths, Huns, and Tatars came by land; the merchants and navigators of Phoenicia, Greece, Rome, and Genoa came by sea. During the course of many centuries different peoples and different cultures had come into conflict here. In the 18th century the Crimea was annexed to Russia.

Soviet Crimea has created an industry of Union importance, extended its acreage under valuable southern crops, and become a holiday resort for the working people of the whole of the Soviet

Union. Nearly half the health resorts of the USSR are situated in the Crimea. The Crimean ASSR produces tobacco, rails, salt, bromine, grapes, apples, essential oils for perfumes, and the finest canned fruits in the country.

By 1936 industrial output had increased more than fourfold as compared with pre-revolutionary times, and the area under crops had increased by 20%. The area of the tobacco plantations had increased more than threefold. Four-fifths of the land has been handed over to the collective farms; the rest is occupied by State farms, health resorts, and towns.

* * *

A railway traverses the Crimea from north to south. The train crosses the Bay of Sivash over a dike and a low bridge. The sea-shore gleams with snow-white salt deposits. The Crimean steppe begins: a level expanse stretching to the horizon, with much tilled fertile brown soils, but somewhat droughty. Zinc elevator towers rise by the railway stations. A smell of wormwood pervades the atmosphere. The railway bed is strewn with cockle-shells. Nowhere else in the country is the evenness of the steppes so perceptible as here; one expects to see the mountains, but so far they are invisible.

The steppes occupy the whole of the north of the Crimea—four-fifths of its territory. Formerly they were cultivated solely for one-sided grain-growing, which exhausted the soil. Now in the rotation of crops the collective farms and State farms have introduced other plants, new to the region. In addition to high quality, early ripening wheat which is reserved for export, cotton and sorghum are sown here. The proportion of tobacco and grass plantations has been increased. This rotation of crops multiplies the harvests; the fodder-grasses have led to the development of cattle-breeding. New roads have been laid, and new wells dug; poultry farming has been introduced; vineyards have been laid out, and brickyards, tanneries, and oil-mills constructed.

The bluish contours of mountain summits are seen on the horizon. The steppe becomes hilly. The train has approached the mountains.

The Crimean Mountains stretch along the south coast in three steps rising towards the south. Their highest summit is Mount Roman-Kosh (5,062 feet). In the north the Crimean mountains slope down gently; in the south they terminate in an abrupt precipice over the Black Sea. The summits of the southern ridge, which are formed of limestone, are flat and grassy. Their sides are grown over with pines and beeches, and deer live in the Crimean Preserve (79,000 acres in area).

A primitive form of cattle-breeding prevailed in the mountainous districts of the Crimea in former times. Now it has been improved, and in the valleys the State farms have laid out huge orchards. The trees on the Crimean mountains used to be cut down indiscriminately, which led to the drying up of the rivers and the increase of droughts. Now the forests are carefully protected.

On the eastern edge of the Crimea, near a rich bed of iron ores, stands the town of Kerch with a large metallurgical plant. Formerly, the Kerch ores were considered to be of inferior quality owing to the admixture of phosphorus in them. Now excellent steel is manufactured from them and phosphoric fertilizers are obtained as a by-product.

A canning and a machine-building industry have sprung up in Simferopol, the capital of the Crimean Republic. Simferopol is the cultural center of the Crimean Tatars; there are several universities here, printing-plants issuing national literature, and Tatar theatres.

A wall of mountains protects the narrow southern sea-coast from north winds. Motor roads run from Simferopol and Sevastopol, which lie on the railway, over the passes of the Crimean mountains. Here is a region of cypresses, grapes, olives, and other valuable southern plants. The most important health resorts are Yalta, Aloupka, Miskhor, Livadia, Aloushta, and Gourzouf.

The sea almost touches the foot of the mountains. Overhanging the boundless blue expanse are the high slopes of the brownish-grey mountains with their green patches of gardens and plantations and white marble palaces. The summer is dry and hot, and there is practically no frost in winter. In Yalta the average temperature for July is 75.4° F. and for January 38.6° F.; atmospheric precipitation amounts to 24 inches. The last flowers of autumn are followed

by spring flowers, with no interruption at all. Almonds bloom at the beginning of March.

The former tsarist palaces and villas of the south coast of the Crimea have been turned into vacation resorts and sanatoriums. During the years of Soviet power, particularly during the period of the two Five Year Plans, splendid new rest homes and sanatoriums have been built on the south coast of the Crimea. Those workers who have distinguished themselves on their jobs, and those who particularly need special health resort treatments, stay here free of charge.

THE URALS

THE URAL-KUZNETSK COMBINAT

Until recent years the coal and metallurgical base in the Ukraine (in the south European part of the USSR) was the only one in the country. The Donbas provided the main supply of coal and on its coal the greater part of pig-iron and steel was produced from the ore of Krivoi Rog. The country depended upon the southern mines and blast furnaces.

During the post-revolutionary years the Ukraine trebled its output of coal and metal. But this rapid growth would nevertheless have been inadequate had the coal and metallurgical base in the Ukraine remained the sole center for the industrialization of the country. It was necessary to create a second coal and metallurgical base in the Soviet East which was rapidly becoming industrialized.

As far back as 1930, speaking at the XVIth Congress of the Communist Party of the Soviet Union, Stalin said:

"One of the new features in our national economic development is, incidentally, the fact that this base* has already become inadequate for us. While continuing to develop this base in every possible way in the future too, we must immediately begin to create a second coal and metallurgical base. This must be the Ural Kuznetsk Combinat, the combination of Kuznetsk coking-coal with the ores of the Urals."

* The coal and metallurgical base in the Ukraine. Author.

The Urals are rich in iron ore, but comparatively poor in coal. Kuzbas (in Western Siberia), on the other hand, is rich in coal, but comparatively poor in iron ore. The Urals and Kuzbas are separated from each other by 1,240 miles of perfectly even West Siberian lowlands. To the North stretch taiga forests, to the South fertile steppe.

The construction of the Ural-Kuznetsk Combinat was launched on Stalin's initiative in the vast, previously backward and, in some parts, entirely desert country stretching from the Urals to the Yen-issei. The whole of Western Europe without its peninsulas could find room on the territory of the Ural-Kuznetsk Combinat. And so, in the previously neglected Urals, in Siberia which at one time was a penal settlement, a powerful industrial area has been created: a pillar of industrialization of the entire Soviet East—the new coal and metallurgical base.

The selfsame trains, made up of spacious hopper cars, carry ore from the Urals to Kuzbas and coal from Kuzbas to the Urals according to a fixed time-table. At both ends of this route work new giant plants. From the Siberian coal and Ural ore they produce pig-iron, steel, and rolled metal.

The Ural ore lies at a distance of 1,400 miles from the Kuznetsk coal. Nowhere in the world is it necessary to transport metallurgical raw material by train for such long distances. In the U.S.A. iron ore is transported from Minnesota on Lake Superior to Pennsylvania for almost the same distance, but there it goes not by rail but by cheap water-transport. The socialist mode of production in the USSR, however, has made this railway transportation profitable. Everything has been calculated in advance, everything is embraced in a single State plan. Mass production, running with full cars, and the cheapness of mining excellent raw material more than pay for the long journey. Magnitogorsk pig-iron is the cheapest in the USSR. Construction of machinery is accompanied by the growth of metallurgy; the plan eliminates all disparity between the production and consumption of metal.

Karaganda, the new coal basin in Central Kazakhstan, also assists in supplying coal to the Magnitogorsk Works. Investigations have shown that Karaganda coal has good coking qualities. This will

greatly increase the quantity of coal supplied to Magnitogorsk by Karaganda which is nearer to Magnitogorsk than Kuzbas by almost 620 miles.

During the two Five-Year Plan periods an industrial area has been created in the East which will stand comparison for productive capacity with the whole of pre-war Russia. In 1936 the output of coal in the East amounted to 40,700,000 tons, or more than the output in 1913 of the whole country; the output of pig-iron in the East was 4,000,000 tons in 1936, almost as much as the output of the whole country in 1913. (See Map 13, page 62.)

The Ural-Kuznetsk Combinat does not only produce coal, iron, and steel. Its plants also smelt non-ferrous metals: copper, nickel, and zinc; machines are manufactured from the metals. The engineering works of the Ural-Kuznetsk Combinat produce everything necessary for the development of national economy on its territory; it provides agriculture with agricultural machinery, the mining industry with mining equipment, and so on. Agriculture is developing on the territory. The skeleton of heavy industry has from its inception been supplemented by light and food industries.

One-sidedness in development, which the Ukrainian coal and metallurgical base suffered prior to the Revolution, is alien to the Combinat. Just as in the Ukraine, not only a mining but also a manufacturing industry is now developing. The Ural-Kuznetsk Combinat is a unified, powerful, advanced industrial area.

THE REGIONS AND REPUBLICS OF THE URALS

The Urals form a wooded, jagged threshold between Europe and Asia. Its ridges, running abreast and parallel to each other mainly along the meridian of 60° E. stretch for 1550 miles from the Polar seas to the sultry deserts. The width of the Urals ranges from 31 to 93 miles.

For millions of years water and wind, heat and frost, eroded the Ural mountains and laid bare their hidden minerals. The old and decayed Urals are incalculably rich.

Along the mountain range stretch mighty deposits of rich and pure iron ore: Mounts Vysokaya and Blagodat at Tagil, Bakal at

Zlatoust, Mount Magnitnaya in the south. Copper has been discovered along the whole of the mountain range: at Krasno-Uralsk, Sverdlovsk and Orsk. For chemistry there is potassium salt, pyrites and other raw material here. There is not a little oil, gold, nickel, bauxites (the raw material for aluminum), bismuth, molybdenum and tungsten. The Urals are famous for their platinum, asbestos, emerald, jasper, malachite, rock-crystal, amethyst and topaz. Here (east of Chelyabinsk) is the Ilmen Preserve—a natural museum where 100 minerals have been discovered on a comparatively small area. The one thing that is scarce in the Urals is coal.

The Ural mountains are comparatively high in the north (Mount Narodnaya, 6,150 feet) and in the south (Mount Yaman-Tau, 5,376 feet). In the central part, at Sverdlovsk, it is possible to cross the range without seeing a pass. Here the range diminishes in height to 980 feet.

The climate of the Urals is continental: a hot summer and a cold winter but, as in Siberia, it is comparatively easy to endure these extremes for there are no winds (with the exception of the southern Urals) during the severe frosts. In Sverdlovsk the average temperature is 63° F. in July and 3.2° F. in January. Atmospheric precipitations average 17 inches.

The first metallurgical plant in the Urals was built three centuries ago, in 1631. In the dense forest valleys, on the banks of rivers navigable only to rafts, charcoal-burning blast furnaces were erected.

Peter I attached serfs to the Ural works. Metal, which captured the markets of Western Europe, was produced by the labor of Russian peasants. The Urals armed the Russian land. But the labor was terribly hard, and the flame of rebellion never died down in the Urals.

Serfdom was the basis of the prosperity of the Urals, but it also became the cause of its decline. In the epoch of the rapid development of capitalism, serfdom hindered the Urals from growing and perfecting technique. They were quickly outstripped by the young metallurgical regions of the West.

Soviet power found more than 100 small and backward works in the Urals. Some of them were far away from railways. Blast

furnaces were found in which the charge was brought to the furnace by horse. The semi-handworked furnaces with cold blasts were 200 years old.

The Soviet Urals have become the leading section of the Ural-Kuznetsk Combinat, a region of powerful modern heavy industry: metallurgical, machine-building, chemical.

A metallurgy using coal was created. The new Magnitogorsk Works, with the aid of Kuznetsk and Karaganda coke, smelts almost double the quantity of pig-iron smelted in the entire Urals prior to the War.

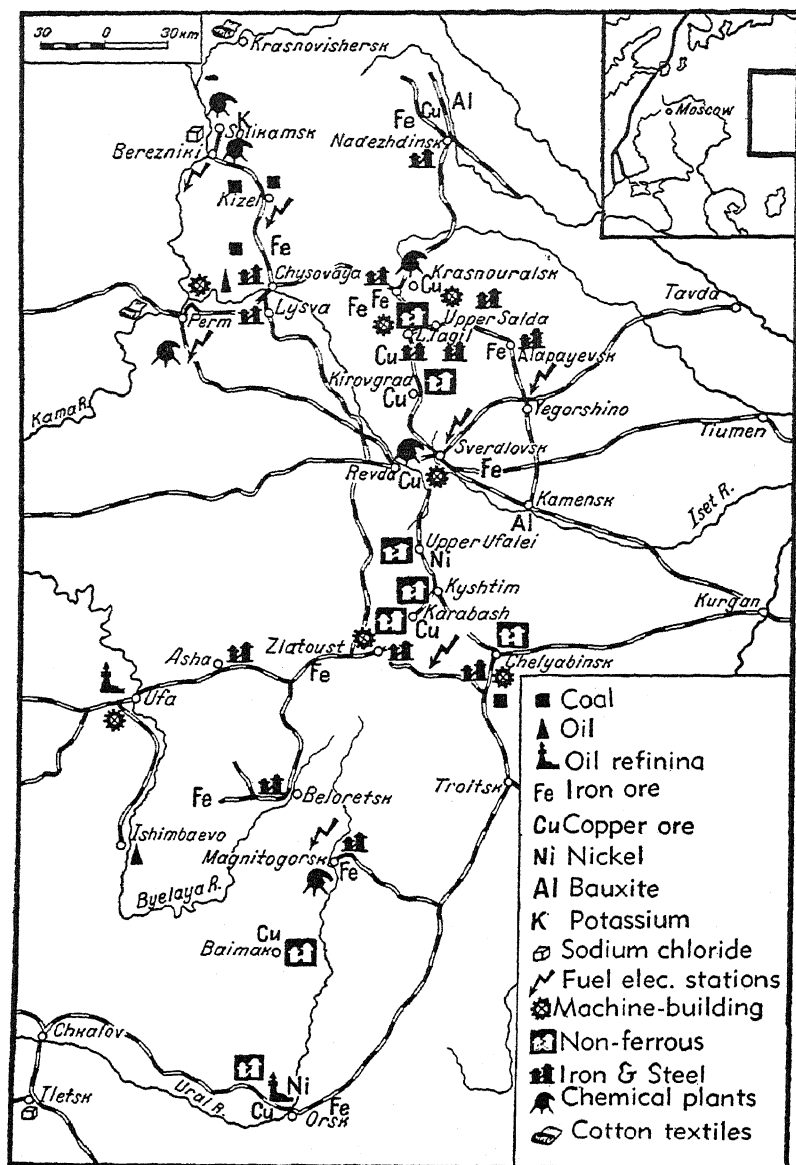
Charcoal-burning metallurgical plants of the Urals accomplish responsible tasks. The best of the old and now reconstructed plants, working on charcoal, smelt high-grade steel for complex machines from the pure Ural ores. In 1913 the Urals smelted 900,000 tons of pig-iron, and in 1937, 2,600,000 tons.

The old copper smelting works have been renovated; new works with improved equipment have been built. The Urals are now the most important region in the USSR for the production of copper. Besides copper, other non-ferrous metals are produced here: nickel, zinc and magnesium. Aluminum will also be produced in the Urals. In the past the Urals exported the whole of its metal without working it up. Today an advanced machine-construction industry has been established.

On mineral raw material (common salt and potassium salt, phosphorites, chromites and other chemicals) and on the waste products of other industries (sulphur gases from copper pyrites, waste products from coking and coal burning and so on) a mighty chemical industry has been created. The power resources of the old Urals were furnished by the water-wheel and the horse. Today the industrial Urals—from Berezniki in the north to Magnitogorsk in the south (435 miles)—are intersected by the powerful lines of a single high voltage power system.

During the two Five-Year Plan periods 200 new important enterprises were built in the Urals, and today its regions are full of the scaffolding of factories under construction.

In the Urals are situated the Perm, Sverdlovsk, Chelyabinsk and Chkalov (formerly Orenburg) Regions, the Udmurt ASSR and



MAP 19—LOCATION OF INDUSTRIES IN THE URALS

the Bashkir ASSR, with a total area of nearly 329,000 square miles. The location of the industries in the Urals is shown on map 19 (page 154).

* * *

Into the Northern Urals, through forests, up the River Kama: on a sloping sandy bank to the right lies one of the oldest Russian settlements in the Urals, the old town of Usolye.

The high timber framework of the salt mines have been preserved here almost from the time of Ivan the Terrible. Wooden warehouses have sunk into the earth. The 300-year-old stone mansions of the salt-mine owners, who were at the same time semi-feudal lords, are as heavy and austere as fortresses.

On the other bank of the river, the large Berezniki Chemical Combinat was built during the First Five Year Plan period. This combinat is a whole city of ferro-concrete, spacious, glazed factories and towers, with the hissing of steam, the roar of machinery, the clamor of buffers. Nitrate fertilizer, soda, acids are loaded on railway trucks. Half the sky is enveloped in smoke.

Thus the new invades the old and changes it. The former town of Usolye is now part of the new city of Berezniki. Workers and engineers live there. A three-centuries-old house has been turned into a museum.

Not far from Berezniki is Solikamsk. Here, ever since the 15th century, salt solutions were pumped up from underground, trees from the forests in the outskirts were burnt and salt obtained by evaporation. The salt boilers in thick low stone walls are still preserved. Now enormous quantities of potash salts, of which deposits have been discovered during the Soviet years, are being extracted here from a large mechanized mine. This potash salt is used for fertilizing fields. There are 18,400,000,000 tons of potassium oxide in Solikamsk. Metallic magnesium, which previously was wholly imported from abroad, is now also produced here. A railway has been built in this district in Soviet times.

North of Solikamsk, in the dense and wild Cherdyn forests, the Krasnovishersk Cellulose-Paper Combinat was built in a year and a half. It produces high quality paper.

South of Berezniki is Kizel, the principal coal-mine district in the Urals. It lies among the mountains overgrown with fir forests.

In the past only horizontal drifts were worked in Kizel. Today new powerful vertical collieries are working. In the past Kizel coal was considered unsuitable for metallurgy. It has now been established that a mixture of Kuznetsk and Kizel coals produces coke. On this coke the new Tagil Plant will operate. In Kizel 1,100,000 tons of coal were mined in 1927-28, while in 1936 the quantity mined amounted to 3,600,000 tons.

An electrified railway runs from Kizel to the south, the most beautiful railway line in the Urals. Upright, shapely masts carry bright copper cables across mountain forests. The railway track winds along the slopes. The electric trains run along the edges of deep ravines and disappear through tunnels.

At Chusovaya Station, the electric track emerges at the river Chusovaya, which in the 19th century, before the construction of the railway, was the chief transport artery for the Ural region of mines and factories. Fifty factories rafted their metal along the river. On an appointed day, once a year, the sluices of ponds at the works would be opened and a great wave of water would roll along the river to propel the barges, which frequently were smashed against the rocky sides of the banks. Today the river Chusovaya is a route for tourist canoes.

Near Chusovaya stands one of the largest of the old metallurgical works. To the two old blast furnaces a new, completely mechanized furnace has been added. This is the largest charcoal blast furnace in the world. At the Chusovaya works the production of ferro-vanadium has been mastered. Farther down the river is Chusovaya Gorodki. In 1929, the first oil in the Urals was discovered here. Further west, on the bank of the Kama River, lies Perm, a large city with engineering, shipbuilding and woodworking industries. Alongside it, in Krasnokamsk, oil is extracted and paper is manufactured. Below Perm stretches a spacious, undulating well-plowed agricultural district, supplying potatoes and grain to the mining and industrial Urals.

From Chusovaya the electric train runs farther south to Sverdlovsk. It penetrates to the very heart of the industrial Urals.

The mountains have become lower, the valleys wider, and there are more foliage trees. An industrial landscape unfolds before us: smoke of factory chimneys over the forest; masts of high voltage electricity transmission lines along the countless lanes cut out in the forest; new factory blocks at every station; building operations everywhere.

In Tagil, a works for the production of large freight cars has been built and the construction of a huge metallurgical plant is being completed. Copper is produced at the new Krasno-Uralsk Works. Heavy structures for bridges are built in the new works at Verkhne Salda. Sulphur is extracted at the Kirovgrad Copper Works. A new copper combinat is under construction at Revda. Tubes are produced in the rolling mills of the new plant in Pervo-Uralsk. In Pyshma, crude copper is refined at a new plant. Asbestos is extracted in the region of the new town of Asbest and gold is mined in Berezovo.

Capital investments in industrial and cultural construction in the Sverdlovsk Region during the Second Five Year Plan period have increased by 300% as compared with the First Five Year Plan. By the end of the First Five Year Plan period the electric power stations of the region generated 610 million kilowatt-hours, while by the end of the Second Five Year Plan the output amounted to 2,340 million.

And now we arrive at Sverdlovsk, the most important city in the Urals. It lies along the eastern side of the mountain range on the river Iset (Ob Basin) amidst pine forests. Sverdlovsk is a junction of seven railways. The population of Sverdlovsk has increased from 70,000 inhabitants in 1920 to nearly half a million at the present time. There are 22 higher educational establishments in the city.

Old Yekaterinenburg (as Sverdlovsk was previously called) was known only for its skillful cutting of Ural precious stones. The new Sverdlovsk is known for Uralmash, the abbreviated name for a huge works producing machinery and equipment for metallurgical and other industries. Various plants producing high voltage apparatus, lathes and other machine tools, and a large electric power station have also been constructed in Sverdlovsk.

South of Sverdlovsk the conifer forest becomes thinner. A transition to forest steppe begins. Here lies the Chelyabinsk Region.

Passing Ufalet where the nickel of Kasli (a workers' settlement famous for its popular cast-iron sculpture) is smelted, and the Kyshtym District (where copper is produced), the train arrives at Chelyabinsk, situated amid birch groves on a plain along the Siberian side of the Ural mountain range, on the river Miass (Ob Basin).

Chelyabinsk is a living model of the new Urals. Favorably situated, it is today a most important industrial center. Here railways intersect, here there are coal deposits and sufficient water, while the flatness of the territory makes it a convenient site for building. In the past it was a small provincial commercial town. In 1933, on Stalin's initiative the largest plant for the production of caterpillar tractors was built in Chelyabinsk. A huge electro-metallurgical combinat has been constructed producing ferro-alloys required for the production of steel.

In this city a new zinc works is in operation which utilizes the waste products of copper plants in the Urals. Lignite is mined straight from the surface. A large machine tool construction works is being built. Powerful electric stations supplying electric energy to the unified power system of the Urals have been built.

East of Chelyabinsk is a plain with the wheat fields of State and collective farms and the grazing pastures where cattle are raised for meat products. In the Chelyabinsk Region which lies farther to the south, agriculture is developed more intensively than in the Sverdlovsk Region. In the west are the wooded high Southern Urals with mines and factories. Here, not far from the pass beyond the "Europe-Asia" post, under the shaggy Mount Kosotur and near the large pond of the works, stands Zlatoust, the center of high grade metal and birthplace of Russian steel knives, noted for the keenness of their blades. In the Zlatoust district a gigantic metallurgical works will be constructed during the Third Five Year Plan which, with the aid of Kuznetsk coke, will transform the iron ore of Bakal (an iron deposit southwest of Zlatoust), considered to be among the best in the world for its purity, into high grade steel.

To the south the train runs along the dry desert steppe. The horizon is shut out by the grassy humps of sloping hills. . . . Suddenly Magnitogorsk appears, the pride of the Soviet Urals, a stupendous panorama of enormous black blast furnaces, tall chimneys, metal structures, ferro-concrete blocks, automobiles on the streets of a new city, and the famous "iron mountain."

Mount Magnitnaya contains a quarter of all the iron ore deposits of the Urals. On the summit, in tremendous open cuts, excavators load trains with reddish-brown lumps of magnetic iron ore taken from the surface of the earth. At the foot of the mountain the ore passes through machines of the crushing factory. Long coke batteries burn the coal coming from Kuzbas and Karaganda. Blast furnaces, ten stories high, smelt the ore into pig-iron which is poured out in a dazzling thread straight into bucket wagons. Open hearth furnaces transform the pig-iron into steel. Blooming mills press it into shape required for powerful rolling mills which produce rolled metal.

In 1936 the Magnitogorsk Combinat produced 2.5 times more pig-iron than the whole of Poland. When the combinat is entirely finished it will produce a yearly output of 4.3 million tons of pig-iron—slightly less than the entire metallurgy output of pre-War Russia. The city of Magnitogorsk, built on former virgin ground, now has a population of nearly 250,000 inhabitants.

A railway built during the Soviet years connects the Chelyabinsk Region with the Chkalov Region, the extreme south of the Urals. Here the mountain range gradually passes into bare hills.

Previously this was a region with a backward agriculture hardly able to surmount the drought. Today large-scale mechanized agriculture systematically and successfully combats the drought. Industry which has appeared here for the first time has brought the Chkalov Region into the industrial family of the Urals.

A large-scale industry is arising in the eastern corner of the region near the city of Orsk. An oil refinery here refines the oil for Siberia and the Urals, delivered from the Emba oil fields on the coast of the Caspian Sea and sent along a new 12-inch pipe-line nearly 435 miles long. An important meat industry has been established. Nearby in Blyava, a new copper combinat produces sulphur

as a byproduct. Not far from here, in Khalilovo, rich deposits of iron and nickel have been discovered and are already beginning to be worked.

From the west and adjacent to the Perm Region is the Udmurt Autonomous Soviet Socialist Republic (about 15,440 square miles) situated on the rivers Cheptsya and Kilmez, tributaries of the Viatka. Here the western spurs of the Urals gradually vanish and pass into the plain. In the interior of Udmurtia there are many fir forests; in its southern part, forest steppe.

Rye, oats and flax are the principal agricultural crops in Udmurtia.

Izhevsk, chief city of the Udmurtian Republic, is a large industrial center. Here steel from Ural pig-iron, motorcycles, and machine tools bearing the trade-mark "Udmurt" are produced. The largest wood-burning gas station in Europe has been built here. Udmurts (their old name was Votyaks) came to the new plants, took their places at the intricate machines, and learned to operate them.

On the western slope of the Southern Urals lies the Bashkir Autonomous Soviet Socialist Republic (54,250 square miles). The mountain ridges gradually become lower and lower passing into a hilly plain with rich black earth. From south to north Bashkiria is intersected by the river Belaya; on its bank, by the railway which runs from Moscow via Kuibyshev to Chelyabinsk, stands Ufa, the capital of the Republic.

Bashkiria is endowed with valuable forests, a fertile soil, and rich minerals.

Previously grain was almost the only crop sown in Bashkiria; now fodder grasses, sunflowers, and sugar-beet are beginning to occupy an ever larger area in the Republic. As compared with pre-Revolutionary times the sowing area has increased by 78%. Dozens of collective farms have become millionaires, that is, having an annual income of a million rubles or more.

In the upper reaches of Belaya, the works in Beloretsk have been reconstructed. There works produce wire and nails which are sold all over the country. In the depths of the mountain regions of Bashkiria the copper smelting works in Baimak has been enlarged.

Ufa has become an important industrial center. In this city motor

construction works, wood working factories, and an oil refinery have been established.

At Ishimbayev oil gushed from a prospecting well in 1932. Since then one well after another has revealed oil. Both banks of Belaya River—the left sloping and the right hilly—are covered with derricks. An important oil field has been located here, reached by a railway line from Ufa. Oil has been struck in recent years in other districts of Bashkiria, principally Tuimaza. An oil base has thus been established in the Urals. Prior to the Revolution Russia obtained almost all its oil from the Caucasus alone.

A new Bashkirian alphabet has been introduced, a literary language created and Bashkirian writers and poets have come into prominence. Before the Revolution no books in the Bashkirian language were published; in 1936 more than 1,000,000 copies of books were issued. The Republic has both an Academic Bashkirian Theatre and a Russian Dramatic Theatre.

WESTERN SIBERIA

Beyond the Urals stretch the West Siberian lowlands, like a calm sea. They occupy a vast territory, some 1,240 miles in width and about 1,525 miles long (50° - 73° N.). Their borders in the west are the Ural mountain range, in the east the Yenissei River and the Altai spurs, in the south the heights of Central Kazakhstan and in the North the shore of the Arctic Ocean. From south to north the plain is cut by the river Ob and its tributary the Irtish; and from the west to the east is intersected by the Trans-Siberian Railway. Here lies the Omsk Region (556,000 square miles) and the Novosibirsk Region (235,900 square miles).

Along the railway line stretches a belt of black earth forest-steppe with arable land, birch groves and an abundance of small lakes. It is a district of grain and butter.

In the north, the fertile and densely populated forest-steppe land gradually changes to marshy taiga covered with fir and spruce intermixed with aspen. Still farther to the north is the tundra. In the south the forest-steppe is replaced by steppe-land with numerous lakes, the larger of which are Chany and the Kulundinsk lakes.

The farther east we go the more continental we find the climate of the plain: a hot summer and a cold winter. In Omsk the average temperature in July is 67.8° F. and in January the temperature is —3.1° F. Precipitations exceed 11.7 inches.

In Western Siberia Russians constitute the main part of the population; but there are also Nenetses, Khantes and Mansis (in the extreme north), Oirots (in the Altai region) and Kazakhs (in the extreme south).

The railway track, which crosses the West Siberian lowlands, runs a straight, level course. Resembling a factory conveyor, regulated by the light-signals of an automatic block system, trains all of the same type move at regular intervals, in opposite directions. They are lines of hopper-cars loaded with Kuznetsk coal and Magnitogorsk ore, uniting the two divisions of the Ural Kuznetsk Combinat into a single system.

At the point where the railway crosses the Irtysh, stands the city of Omsk with its flour mills, its new factories producing agricultural machinery and an automobile assembly plant under construction. At the point where the railway cuts across the river Ob, is Novosibirsk, a large, rapidly growing city with metal-working, textile and food industries and two big electric power stations.

Southeast of Novosibirsk, between the two spurs of Altai, Kuznetsk Ala-Tau and the Salair Mountain Range, in the hilly steppe and on the river Tom, a tributary of the Ob, lies Kuzbas the Kuznetsk Coal Basin.

The reserves of Kuzbas are tremendous: 450,000 million tons of coal which is five times more than in the Donbas, two and a half times more than in England and twice as much as in Germany. Kuzbas has been prospected almost entirely in Soviet times: prior to the War its ascertained deposits constituted only 13,000 million tons.

The thickness of coal seams in Kuzbas in some places reaches 52½ feet and more. The coal lies near the surface and therefore its extraction is cheap. Kuzbas coal is of excellent quality, having little sulphur and a small ash content. The coals are varied, giving fuel and coke, liquid fuel and chemical products and there are coals

here which can go to blast furnaces without coking (in Prokopyevsk District).

Before the Revolution coal-mining in Kuzbas was insignificant, its coal being consumed only by the locomotives of the Siberian Railway.

Soviet Kuzbas grew by leaps and bounds. The map of the Altai foothills became dotted with numerous new place-marks indicating collieries, ore mines, electric power stations, coke furnaces, blast furnaces, new workers' settlements, new routes. In output of coal Kuzbas will soon overtake pre-war Donbas, thus fulfilling the task set by Stalin at the XVIIth Congress of the Communist Party: "To transform Kuzbas into a second Donbas." In 1938 Kuzbas produced 16,800,000 tons of coal, 21 times as much as in 1913; and today it produces 13 per cent of the total output of coal in the USSR. Mines with a high productivity are working in Kuzbas and consumption of the cheap, first-rate, Kuznetsk coal has reached the Volga.

A gigantic new industrial region has developed around Kuzbas. In Stalinsk, a new metallurgical plant has been erected, the first big iron and steel industrial center to be created in Siberia. Here, rails were produced for the Moscow Metro, and steel for the framework of the Palace of Soviets under construction in Moscow. At first all the ore required by this metallurgical plant was brought from the Urals. Now part of its ore comes from new mines in nearby Gornaya Shoria, discovered a few years ago. In 1936 the combinat smelted 1,400,000 tons of pig-iron which means that Siberia is now producing a third of what the entire iron industry of tsarist Russia produced.

A chemical industry and the production of zinc have been put into operation in Kuzbas. Electric power stations have been erected. A new railway has been laid from Novosibirsk to Kuzbas and from Belovo to Stalinsk the railway has been electrified. Three quarters of a million people live in the new towns of Anzhero-Sujensk, Kemerovo, Leninsk, Prokopyevsk and Stalinsk.

A little to the north of the Trans-Siberian main line and connected with it by a branch line from Taiga Station, is Tomsk, a large cultural center.

North of Western Siberia, lumber camps, reindeer breeding, and

fisheries are developing at places connected with the railway by the rivers Ob and Irtysh as well as by air lines.

South of the Novosibirsk Region lies the Altai Territory, 113,500 square miles. Around Barnaul lies the Altai steppe, which in its natural conditions, is the best agricultural district of Siberia. Here wheat and sugar-beets—a new crop for this region—are planted and livestock-raising is developing.

From Novosibirsk on the Siberian main line, a railway runs to Central Asia via Barnaul. This is the Turksib (Turkestan-Siberian) Railway constructed in 1930. Along this railroad, timber and grain are transported from Western Siberia to the Soviet Republics in Central Asia, and in the opposite direction, cotton, the raw material for the new textile mills of Barnaul and Novosibirsk is carried.

The Oirot Autonomous Region forms part of the Altai Territory.

The steppes, as they rise, are replaced by thick mountain forests of larch, spruce, cedar, and birch, then by meadows overgrown with high succulent grass and, finally, by rocky snow-capped peaks. These are the Altai Mountains, the highest of which is Belukha Peak 14,895 feet.

In the mountains of Oirotia are the head waters of both branches of the Ob: the Bia (rising in Seletsk Lake) and the Katun. The winters are cold in this region and the summers hot, and there is much rain. Gold, manganese, and mercury deposits are found here and an area of two and a half million acres is occupied by a preserve in which the Siberian stag, the muskdeer, the sable, the snow-leopard, the lynx, the bear, and other species of animals live.

Before the advent of Soviet power the Oirots led a nomad life, roaming with their flocks along the Altai valleys. Their dwellings were the *choom*, a cone-shaped tent made of poles covered with the bark of trees. Now the Oirots are settling down in villages, where the *chooms* are being replaced by houses, and around them collective farmers are cultivating vegetable gardens and tilling arable lands.

EASTERN SIBERIA

To the east of the West Siberian lowlands, over an enormous tract between the broad Yenissei River, which traverses the whole

country from south to north, and the watershed ranges which separate the basins of the Arctic and Pacific Oceans, stretch the mountains and plateaus of Eastern Siberia.

The territory of Eastern Siberia occupies nearly half of the RSFSR. Here lie the Krasnoyarsk Territory, the Irkutsk and Chita Regions, the Buriat-Mongolian ASSR and the Yakut ASSR, with a total territory of 2,740,600 square miles—slightly less than that of the United States (excluding Alaska).

The heights of Eastern Siberia are covered with boundless taiga forests of larch, fir, spruce, and pine with bare tracts of steppe-land scattered here and there in the flat valleys. Bare also are the summits of the high mountains. Toward the north the taiga thins out as it descends into the tundra marshes.

The larger part of Eastern Siberia is occupied by the Central Siberian tableland; hundreds of thousands of square miles here are covered with volcanic trap, which in places attains a thickness of a thousand feet. The average height of the plateau is from 1,000 to 1,640 feet but there are places as high as 3,281 feet.

In the south the Central Siberian tableland is enclosed by a number of mountain ranges and high plateaus which rise above it like a high step. Among these are the Sayans (up to 11,450 feet), the Yablonov range (up to 5,282 feet), the Vitim plateau 2,790 to 4,757 feet and the Stanovoy range (up to 8,202 feet).

In the northeast are the Verkhoyansk ranges (up to 8,200 feet), the Chersk (up to 9,845 feet), the Kolyma (average height 4,920 to 5,250 feet) and others.

In the north, along the Arctic Ocean, lies a tract of lowlands which stretch into the interior of the country along the river valleys. Fossil ice is encountered on the coast of the ocean—relics of the ice age which attain a thickness of forty-nine feet and more. Mammoth tusks, and sometimes the complete carcasses of these huge extinct animals are found in a state of preservation in the frozen soil of these regions.

Eastern Siberia is crossed from south to north by great rivers: the Yenissei, the Lena, and others. The length of the Yenissei is 2,492 miles. From the right it receives large tributaries: the Angara, flowing from Lake Baikal, the Podkamennaya Tunguska and the

Lower Tunguska. The length of the Lena is 3,115 miles. It discharges an average of 3,963,000 gallons of water per second into the Arctic Ocean. The tributaries of the Lena—the Aldan (on the right) and the Vilyui (on the left), are each over 1,243 miles in length.

The climate of Eastern Siberia is more continental than anywhere else on earth. It is hot in summer. A powerful anticyclone settles here in winter, from October to March. The weather is dry, windless, bright, sunny, and very frosty. The winters in Eastern Siberia are the coldest in the world. In summer the soil thaws at the surface to a depth of only 1.6 to 6.5 feet. In Irkutsk the average temperature in July is 64.4° F. and in January it is — 6.1° F.; atmospheric precipitation amounts to 14.5 inches.

In the past the lack of roads led to trade only in those articles which were easy to take out, such as pelts and gold. The fur industry was based on the enslavement of hunting tribes which resulted in their impoverishment and extinction. Backward methods of gold-mining spoilt and exhausted the deposits, a large portion of the metal was left in the earth. Industry was non-existent. The Russian population, mainly occupied in agriculture, settled in the southern part of the Territory along the main line of the railway. This remote and wild land of Eastern Siberia was a place of exile. Ice in the north, deserts in the south; and to the west and the east, Moscow and the Pacific Ocean, both almost equally distant.

Soviet power drew Siberia out of this stagnation. The enormous territories of Siberia are traversed by airplane and motor-car. Mines are mechanized. The collectivized fur industry brings prosperity to the hunters. Siberia has begun to make machines for the first time. Soviet engineers have discovered methods of construction under conditions of eternal frost. Agriculture, triumphing over the rigorous climate, is moving far to the north. Untold mineral wealth is being prospected and extracted. New towns—centers of culture—are springing up in the taiga. The rapid economic and cultural development of Eastern Siberia has been furthered by the creation of the eastern coal and metallurgical base—the Ural-Kuznetsk Combinat—which lies a comparatively short distance away, and also by mastery of the Northern Sea Passage.

Vast perspectives have opened up before Eastern Siberia for the utilization of its infinite natural resources. There are huge quantities of coal (for example, over 400 billion tons in the Tungus basin, and 75 billion tons in the Cheremkhov basin); iron ores (the Angaro-Ilim deposits, Sosnovy Baits, Zhelezny Kriazh, etc.); gold, lead, tin, tungsten, mica, and so on. The forest tract is immense.

Deep, wide rivers come rushing down from the hills and along the rocky beds; for example, the Angara, at its mouth, has a flow of water equivalent to 1,321,000 gallons per second. Several hydro-electric stations could be built here with a capacity of 300-2,600 thousand kilowatts. The Angara is particularly suited to the construction of hydro-electric stations because its flow is constant, regulated by the huge reservoir of the Lake of Baikal, where the Angara has its source. The hydro-electric stations of the Angara and Yenissei regions will be able to generate an enormous quantity of cheap power, costing from 0.5 to .25 kopecks per kilowatt-hour. It will draw into Eastern Siberia various industries requiring a large quantity of electric power; aluminum and steel smelting, the distillation of coal into liquid fuel, the manufacture of synthetic rubber, and so on.

Geological exploration is going on at present. The draft solution of the Angara-Yenissei problem is in course of elaboration. The plan of the first Angara hydro-electric station (the Baikal station), to be erected a few kilometers above Irkutsk, has been drawn up in outline.

* * *

The Siberian railway enters the western edge of the Krasnoyarsk Territory * to the east of Taiga Station, just before Achinsk. A tilled and populated forest-steppe region lies along the railway track. This is the most convenient district for agriculture and the most cultivated part of the Territory. After Achinsk the land rises and the conifer forest becomes denser. The train tears through the taiga and descends to Krasnoyarsk down the steep slopes. The town lies

*To this territory Lenin and Stalin were exiled by the tsarist government. Lenin was exiled to the village of Shushenskoye on the upper reaches of the Yenissei; Stalin to the village of Kureika on the lower reaches of the Yenissei within the Arctic Circle.

on the left bank of the broad Yenissei amidst wooded mountains. This is the capital of the Krasnoyarsk Territory, which is 810,850 sq. miles in area, and stretches right along the Yenissei, from the southern borders of the USSR to the Arctic Ocean. The deep river, the backbone of the Krasnoyarsk Territory, is navigable throughout. The distance from the southern border of the Territory to the northern border is close to 1,864 miles.

Krasnoyarsk, which is the point of intersection of two highly important transport arteries—the Siberian railway and the River Yenissei—is likewise the point of departure of a third extremely valuable means of communication—a regular air line leading to the Arctic Regions. Krasnoyarsk is the center for the two principal branches of the national economy of the Territory—the gold and timber industries.

A long railway bridge crosses the Yenissei. The current of this mighty river is so rapid that ropes are stretched across the dressing-lockers for bathers to hold on to. Opposite the town, beyond the river, a large even tract lies at the foot of the conifer covered mountains, the site of the buildings of new Krasnoyarsk factories under construction. New workshops, new blocks of houses stretch one after the other.

From Krasnoyarsk the railway takes an easterly course, traversing a stretch of broken land.

Lying on the upper reaches of the Yenissei to the south of the railway, and surrounded by mountain ranges, is the Minussin Steppe Hollow, with an advanced form of agriculture and cattle-breeding, rich deposits of coal (the Minussin Coal Basin), and iron ore (the Abakan deposits).

Here, in the Altai foothills, lies the Khakass Autonomous Region, which forms part of the Krasnoyarsk Territory. Horse and sheep are reared in Khakassia. The development of industry has also begun; coal and gold are extracted, and also barites, which is used in the manufacture of varnish paints. It is inhabited by Khakasians and Russians.

A huge area is occupied by the taiga on the middle and lower reaches of the Yenissei, to the north of the railway, with vast

deposits of coal (the Tungus Coal Basin), graphite, and gold. At the Arctic Circle the taiga is replaced by the tundra.

Gold-mining is carried on in the Yenissei taiga, at the point where the Angara joins the Yenissei. A new plant in Krasnoyarsk produces the machines for the gold industry.

The timber industry is developing rapidly. Part of the timber is carried out of the territory by rail to Kuzbas in the west; part is rafted to the new town of Igarka which has been built on the lower Yenissei beyond the Arctic Circle. The timber is sawn in Igarka and exported to Europe on the vessels of the Kara expedition which come here annually. A cellulose paper combinat is being built in Krasnoyarsk.

To the east of Krasnoyarsk the railway crosses large rivers, left tributaries of the Angara. Now the taiga hugs the railway track, now it retreats, giving place to tilled land.

The train passes the Cheremkhov coal mines, and, on the fifth day after leaving Moscow arrives in Irkutsk.

The Irkutsk Region (356,260 square miles) is situated to the west of Lake Baikal on both banks of the river Angara. Agriculture is developing in the south of the region along the railway; fur trade and gold-mining are developing in the north.

The principal gold-mining district of the Irkutsk Region is Bodaibo on the river Vitim, a tributary of the Lena. Within the last fourteen years the population of the town of Bodaibo has increased eightfold. The streets are illuminated and are plied by omnibuses; cinemas and clubs have been built. Over 6,000 children attend the schools. A workers' rest home has been built near the town on an island in the river Vitim.

Irkutsk lies on the right bank of the Angara opposite its junction with the river Irkut. The city is connected with the left bank, on which the station has been erected, by a large new bridge which has supplanted the old pontoon bridge. A factory producing dredges and other machines for the mining industry has been built at Irkutsk.

The railway runs from Irkutsk along the mountain corridor of the Angara valley to Lake Baikal, a distance of 41 miles. The track lies just above the river. Its water is transparent, its current swift.

The ravine narrows and is suddenly cut short. Enclosed by wooded and mountainous shores lies the broad greenish-blue expanse of the sea-lake. The Angara rushes out of it swiftly: its source does not freeze even in winter.

Lake Baikal's cold fresh water in places reaches a depth of 5,712 feet. Its transparency is known to measure 131 $\frac{1}{4}$ feet. Its area is 13,200 sq. miles (almost double that of Lake Ontario); its length (in circumference) is 416.3 miles; its maximum width is 45.6 miles. Five hundred and fifty species of animals live here, three-quarters of them native only to Baikal. The lake is covered with ice from January to May, but is navigable during the other months.

The railway skirts Lake Baikal in the south, the track lying at the water's edge, and traversing through fifty tunnels the rocky spurs of the mountains along the shore.

On the east shore of the Lake are the borders of the Buriat-Mongolian Autonomous Soviet Socialist Republic (128,000 square miles).

Amidst pine and larch covered mountains, mainly on the river Selenga, which flows into Lake Baikal, lie even tracts of steppe-land. They are the most densely-populated and cultivated parts, utilized chiefly for cattle-breeding.

The Buriat-Mongols used to live in felt tents. The cattle used to remain in the open all through the winter, so that by spring they would lose as much as a quarter of their weight. The area under crop was negligible and even that was still further reduced when the Buriat-Mongols were forced out of the fertile river valleys. There was no industry; 96-97% of the population was illiterate. A whole army of lamas lived in the Buddhist monasteries (lamaseries)—there were fourteen thousand of them on the eve of the Revolution.

After the October Revolution the Buriat-Mongols, having received national autonomy, rapidly developed their economy and culture.

Collectivization was accompanied by the settlement of the nomads. This transition from a nomadic to a settled life has in the main been completed. Where there were only elaborately deco-

rated lamaseries, there are now schools. In 1937 alone over fifty collective farms built "houses of culture" for themselves.

Buriat-Mongolia is one of the most important cattle-raising regions of the Soviet Union. Long-horned cattle, horses, and sheep are reared here. The number of head of cattle had increased by 1936, as compared with 1933, by 56%. Pedigreed cattle are being introduced into the region.

The settlement of the nomad Buriat-Mongols has led to the tillage of virgin steppes around the new villages. Within fifteen years the area under crop has increased threefold. Fifteen hundred tractors are operating in the collective farm fields.

An industry has been created. A large locomotive and carriage works has begun to function in Ulan-Udeh, the capital of the republic. Houses four stories high are being erected near the plant in a pine forest of a suburb of Ulan-Udeh. Three times as many people will live here as in the whole of Ulan-Udeh (Verkhne-Udinsk, as it was formerly called) before the Revolution. There were four times as many inhabitants in Ulan-Udeh in 1936 as in 1927.

The Jidin tungsten combinat is being built in the south of the Republic, in a region of vast tungsten deposits. Gold is mined in the north, in the Burguzin taiga. A fish-canning industry has sprung up by Lake Baikal. Through this region gravel motor-roads have been laid.

Beyond Ulan-Udeh the railway begins the gradual ascent of the Yablonov range. The train passes through the even and treeless valleys of Transbaikal, surrounded on all sides by massive sloping mountains covered with park-like conifer forests.

The track tunnels through the ridge of the watershed Yablonov range and descends to Chita, a town on the river Ingoda whose waters flow in the direction of the Pacific Ocean. Chita lies at a great altitude, about 2,625 feet above sea level. Its climate is marked by dryness, and continental extremes of temperature. There are severe frosts in winter; the sun is very bright, but does not give much warmth.

In the southern, most cultivated, part of the Chita Region (278,000 square miles), cattle-breeding is carried on along the railway, while in the north and east, fur trade and gold-mining have

developed. Here, not far from Nerchinsk, lies one of the richest gold fields, Balei, which is rapidly being developed. Tin is mined in the southeast part of the Chita Region.

YAKUTIA

In the heart of Siberia, on the great rivers flowing into the Arctic Ocean, and at a distance from the railway, lies the huge republic of Yakutia.

If Yakutia were placed on the European part of the RSFSR, it would occupy the territory from the western frontier to the Urals and from the White Sea to the Black Sea. The Yakut Autonomous Soviet Socialist Republic has a greater area (1,160,000 sq. miles) than any other republic or region of the RSFSR.

The winter in Yakutia is long and rigorous, the frost lasting for seven or eight months.

The quiet snow-clad forest stands under the starry sky. The crack of splitting wood is heard in the intense silence. The mercury is frozen. The rivers are bound by ice $6\frac{1}{2}$ feet thick. Forty, fifty, sixty degrees of frost (by the centigrade thermometer).

Here is the pole of winter cold—in Verkhoyansk ($67^{\circ} 33' N.$) the spirit thermometer registered nearly $-94^{\circ} F.$ The average temperature for January here is $-58^{\circ} F.$ Within recent years it has been established that in Oimekon (370 miles to the southeast, in the upper reaches of the Indigirka) it is colder than in Verkhoyansk. But the Yakut winter is dry and calm, and the cold is borne with comparative ease. Everyone is dressed in furs.

A hot summer follows the icy winter. The days are long and dry and the sun scorches. In Verkhoyansk the average temperature for July is $+59.9^{\circ} F.$ (and this beyond the Arctic Circle). In Yakutsk the average July temperature is even slightly higher than in Moscow ($+66.3^{\circ} F.$ compared to $+65.6^{\circ} F.$). The thermometer often registers 86° to $95^{\circ} F.$ During the short but hot summer, wheat, vegetables, and even melons ripen in central Yakutia.

Yakutia lies in the zone of eternal ice. The frozen layer attains a depth of 656 feet, but this does not interfere with agriculture; on the contrary, it even aids agriculture. There is not much atmos-

pheric precipitation here, and the moisture of the thawed surface layer serves in place of rainfall for the plants.

In summer the soil thaws only to the depth of $3\frac{1}{4}$ feet, yet Yakutia, except for the tundra region in the extreme north and the tracts of steppe-land, is to a large extent covered by forests. Larches, whose roots stretch out horizontally, do not fear eternally frozen soil. The larch is a tall, slender tree with lacy needles which fall off in winter. The huge larch forests of Yakutia represent immense wealth: iron girders for subaqueous structures can be replaced by larch, which is hard, durable, and does not rot.

The Yakuts are a Turkic people, the most numerous nationality inhabiting Siberia (excepting the Russians). Formerly they lived much farther south, but were ousted by other peoples and forced to settle in the basin of the river Lena, where they, in turn, ousted the Evenks (Tunguses) who were settled here. Yakut settlements are scattered all over the large flat hollow of a former lake in the center of Yakutia, around Yakutsk and along the Vilyui, a tributary of the Lena.

Pre-revolutionary Yakutia offered nothing but a supply of pelts. The hunters killed the animals by discharging small shot into their eyes, and gave away pelt after pelt in payment for the alcohol and matches of the fur buyers. Ten red foxes, valued at thousands of dollars, cost the buyer forty pounds of tobacco.

Perhaps no people lived in greater poverty than the inhabitants of Yakutia. Twenty or thirty persons, together with their cattle, were huddled in small tents. The aristocracy—the Toyons—owned the greater part of the land and cattle. The people hardly knew the taste of bread. A poor family consumed on the average 360 pounds of pine and larch sapwood a year.

Twenty-two famines occurred within fifty years in North Yakutia in the last century. Famine—not undernourishment; undernourishment was chronic and considered nothing out of the ordinary. Famine in pre-revolutionary Yakutia killed thousands of people, brought desolation to whole regions. Within twenty years preceding the Revolution the decrease of the female population of the Olekmin District, for instance, amounted to 16%.

In Soviet Yakutia there are neither toyons, nor kulaks, nor pri-

vate traders. The republic has begun to develop in a well-rounded way. Besides engaging in the fur industry, the inhabitants mine gold and coal, and are beginning to curry leather and manufacture fish products. The gold industry occupies the leading place in the industry of Yakutia, and is of importance to the whole of the Soviet Union. Coal is mined for the purpose of supplying steamers with fuel. Hunting, which is of great importance in the northern regions, is organized on a cooperative basis and brings large incomes to those engaged in it.

The principal occupation of the Yakuts, cattle-breeding, has changed in character. Formerly the cows gave little milk during the long winter; penned up in small stalls and given scant rations, they were barely able to survive until spring. Now more fodder is laid in during the short summer, with the aid of mechanized harvesting and ensilage, which has been introduced for the first time. The milk yield of the cattle is rising. Many butter dairies, unknown before, have been built.

Formerly only the Russians grew grain: now the Yakuts also are engaged in agriculture. Five hundred tractors are at work in the fields. During the Soviet years the collective farms and State farms have increased the area under crop two-and-a-half times—almost to 250,000 acres in 1936—by means of stubbing up the taiga. Spring rye, wheat, barley, and vegetables are planted. Plant cultivation has moved far to the north—to the very “pole of frigidity.”

The huts of clay-covered vertical logs are being replaced by bright and spacious houses. Wooden floors are laid, and the stalls are separated from the human living quarters. Brick ovens are built in which the Yakuts bake bread for the first time. The windows are fitted with glass panes instead of lumps of ice.

A Yakut written language has been created. Yakut writers, artists, and actors have come into prominence.

The road to Yakutia begins in Irkutsk. An automobile road has recently been laid between the Angara, on which stands the town of Irkutsk, and Ust-Kut, the point of departure of steam-navigation on the Lena.

The steamer sails down the Lena. During Soviet years the num-

ber of these steamers has doubled, new steamers having been sent to the Lena along the Northern Sea Passage from the west.

The Lena is one of the largest and most beautiful rivers in the world. Now it broadens, now it narrows between the high steep banks, on whose rocks trees are growing.

From Ust-Kut, a voyage of 1,243 miles has to be made to reach Yakutsk (62° 1' N.), the capital of the Republic.

Yakutsk is a wooden town situated at a short distance from the left bank of the river, which, together with its islands, is 15½ miles wide here. Yakutsk is the center of the Yakut culture, possessing a Pedagogical Institute, theatres, a radio center, rich archives and a library, and six newspapers. The town has a tannery, a saw-mill, and a brickyard. A relic of the second half of the 17th century—a hipped square tower—is a reminder that Russian Cossacks were the founders of the town.

Yakutsk is surrounded by the principal agricultural region of the republic. Yakut settlements lie along the rivers or on the meadows surrounding the lakes.

A sea route from the west to Yakutia was laid in 1933. Steamers arrive at Port Tixie, built near the mouth of the Lena. Here their freight is transferred to river vessels which carry it down the Lena into the heart of Yakutia. The Sangarkhai coal mines on the Lena near Yakutsk were created for the purpose of supplying the ships with fuel.

Ten years ago another route to Yakutia was laid. A new motor-road to Tommot—a landing-stage on the Aldan, a right tributary of the Lena—runs from the railway station of Bolshoi Niever (to the east of Chita) straight to the north over the passes of the Stanovoy range and through the larch taiga. The motor-road passes through the town of Aldan (formerly Nezametny), the chief town of the Aldan district gold fields, the largest industrial district of Yakutia. Formerly the journey from the railway to Aldan took twenty days; now the motor covers the whole distance in eighteen hours.

Aldan district gold fields, which were discovered only in 1923, produce a considerable part of Soviet gold. Settlements, electric

power stations, and state dairy and vegetable farms are now to be seen in the formerly desolate taiga.

Roads diverge from Yakutsk to the district centers, including the most distant of them in the northeast, beyond the arc of the Verkhojansk range, which is extremely difficult of access. Tracks beaten by beasts of burden, run for thousands of miles through the swampy taiga and over the mountains, but they are impassable for several months.

This is the most remote region of the country. It was only recently that hitherto unknown high mountain ranges were discovered here.

Evenks, Yakuts, and Russians have united in collective farms. Hunters have substituted small-bore rifles for their firelocks. They sell the pelts of polar foxes, dark-tailed squirrels, and silver foxes to the state. Reindeer and cattle-breeding are developing. There is fodder for cattle in these regions up to 71° N.; the horses graze on green fodder the whole year round. Agriculture has appeared for the first time. Scientific expeditions work here. An extremely rich district of ores has been discovered in the west of the Verkhoyansk range, and preparations are being made for its exploitation. Tin has been discovered, and also silver, lead, zinc, antimony, tungsten, molybdenum, and gold. Ships now sail down the Yan, Indigirka, and Kolyma.

Yakutia possesses two regular air lines: the Irkutsk—Yakutsk—Tixie, and the Rukhlovo (near Bolshoi Niever)—town of Aldan (formerly Nezametny).

THE SOVIET ARCTIC REGIONS

THE NORTHERN SEA ROUTE

In the north the Soviet Union extends almost to 160° longitude from Murman to Alaska, embracing the Polar Basin in a half ring. Here lie the Soviet Arctic Regions in which the northern trans-polar parts of a number of regions, territories and republics are included (see map 20, pp. 188 and 189).

In these parts there is woodless tundra (marshy plain) cut up by

channels of northern rivers. In the south it is shielded by a wall of taiga, in the north it faces the Arctic Ocean. The year is divided into a long summer day with a sun that never sets, and a long frosty night illuminated by the aurora borealis.

The Soviet Far North is rich in minerals, fish, fur and sea animals, but all its wealth remained unexplored and untapped prior to the Revolution. The geological map of the Arctic was then a continuous chain of blank spots signifying the unknown. The peoples of the North were dying out. Although the Arctic regions exercise a great influence on the climate of the country, their meteorology had not been studied.

The fundamental problems of the Arctic regions are now being solved by Soviet Arctic explorers. Not a single country is doing or has done as much for the exploration of the Arctic regions as the Soviet Union. Every year the Arctic Ocean is crossed by expeditions and the network of scientific Arctic stations is increasing. Before the Revolution there were only five such stations, while now there are more than fifty (57 in 1937). The Soviet Arctic regions possess an uninterrupted radio service. Scientific workers take turns in wintering at the most distant points, year after year. Scientific ice forecasts are prepared.

More than 1,500 minerals deposits (gold, nickel, tin, tungsten, molybdenum, graphite, coal, fluor spar and other minerals) have been discovered and the extraction of minerals has begun.

The main task in the Soviet section of the Arctic regions is to master the Northern Sea Route, turning it into a normally navigable route which will permit a regular connection between the western and eastern parts of the USSR and serve as a base for the economic and cultural growth of the entire Soviet Far North.

In the past merchant ships rarely reached the mouth of the Ob from the west and the mouth of the Kolyma from the east. The sea border from the Ob to the Kolyma was closed; navigators shunned it in fear of its ice and its uncertainties. The northern extremity of Siberia—Cape Chelyuskin ($77^{\circ} 41' \text{ N.}$, $104^{\circ} 17' \text{ E.}$)—had been rounded only by the ships of scientific expeditions.

Now a caravan of Soviet and foreign ships comes every summer from the west to the lower reaches of the Ob and Yenissei Rivers,

bringing cargoes of industrial goods and carrying away timber. In 1924 ice-breakers escorted 3 ships through the ice of the Kara Sea; later they escorted 4, 5, 6, 8, 26 and 50 ships.

The Kara expedition has now become an institution. There are also regular sailings between Vladivostok and Kolyma and to the River Lena both from the east and from the west.

To open up a through route along the entire Arctic coast, to connect the Pacific Ocean with the Atlantic, there remained only the problem of joining the western and eastern segments.

The distance from Leningrad to Vladivostok via the Suez or Panama Canal is 14,292 miles. Along the Northern Sea Route the distance between these two points is only 9,940 miles. It is still nearer from Murmansk to Vladivostok, only 6,835 miles, the same as by rail.

Sailors and scientists had been dreaming for ages of a passage along the northern shores of Asia. As far back as the 16th century Europeans were vainly seeking such a route to China.

Only three persons succeeded in surmounting the difficulties of the Northern Route: Nordenskiöld, a Swede, in 1878-1879; Vilkit-sky, a Russian, in 1914-1915; and Amundsen, a Norwegian, in 1918-1919. Each one of them, however, had to winter en route, and the necessity of wintering deprives the Northern Route of any practical value.

In the USSR the task was set of sailing from ocean to ocean in one summer and to open up a regular line.

In 1932 an expedition on the ice-breaker *Sibiryakov* started on the voyage from Archangel to Vladivostok. In the Chukotsk Sea the ship broke its screw propeller. Winter came on and the sea froze. The crew broke the ice by detonating charges of ammonal, and after putting up the ship's sails, they entered the open waters of the Pacific Ocean.

A year later the steamer *Chelyuskin* followed the route of the *Sibiryakov*. The ice blocked it from getting out of the Bering Strait, dragged it back to the Chukotsk Sea and there crushed it. Soviet flyers rescued all the Chelyuskinites and even their dogs from an ice floe.

Next year the ice-breaker *Litke* successfully sailed through the

Northern Route and a year later, in 1935, a regular line was established. In 1933 the Soviet fleet carried to the Arctic Ocean 136,000 tons of freight, and in 1937 the tonnage was increased to 275,000.

Powerful ice-breakers have been built for the Northern Sea Route. Depths are sounded, lighthouses erected, accurate charts made, fuel bases established and ports constructed. New river routes have been opened up from the sea shore to the interior of Siberia. For instance, for the first time steamers have sailed along the Piassina, Yana, Indigirka, and Kolyma Rivers, 900 to 1,250 miles in length, which were previously little known even by name. During the years 1933-1936 river traffic in the Arctic increased more than threefold.

The Soviet Arctic regions are intersected by air lines. In 1932 flying hours in the Arctic regions amounted to 500; in 1937 the figure had increased to 16,000. In the latter year planes in the Arctic carried 1,600 tons of freight and 8,800 passengers. For the first time industrial enterprises and a center of agriculture have been established in the Arctic regions.

A travelling trans-Polar theatre has been founded. During three years spent in visiting Arctic stations and ships, it covered more than 31,000 miles and gave 269 performances. On board ship, amidst Arctic ice floes, professionals played Molière and other classics.

The Northern Sea Route is being mastered, opening the way for the rediscovery of the Soviet Arctic regions.

* * *

A steamer sails from Murmansk with a cargo of industrial goods for the Far East. Leaving behind it the rocky corridor of the Kola Bay, it turns to the right and crosses the Barents Sea, which is now one of the best known seas on the globe. A large part of it does not freeze in the winter. In the north lies an archipelago belonging to the Soviet Union, Franz Josef Land, an agglomeration of 800 islands almost entirely covered with an ice cap. The archipelago had been very little studied until 1929, when a Soviet expedition, on the ice-breaker *Sedov*, went there and built a scientific station on Hooker Island in Tranquillity Bay. At the station they rectified the map of the archipelago, and in doing so certain geographical

discoveries were made; the non-existence of a number of islands shown on the old maps was established, while new islands were discovered and named the Komsomol (Young Communist League) Islands. In 1932 the most northerly Arctic station in the world was built on Rudolf Island ($81^{\circ} 41' N.$) and this has become the base for the exploration of the central parts of the Arctic.

The steamer approaches Novaya Zemlya, two large islands stretching from south to north, on the west coast of which live the Nenets people. Between Novaya Zemlya and the mainland lies Vaigach Island where zinc and lead have been discovered; and fluor spar mines are being developed in Amderma on the coast of the neighboring mainland.

The first difficulties begin at Novaya Zemlya. The Kara Sea may be crossed by four routes: by Yugorsky Shar (a strait between the mainland and Vaigach Island), by the Kara Gates (a strait between Vaigach Island and Novaya Zemlya), by Matochkin Shar (a strait between the islands of Novaya Zemlya) and around the northern extremity of Novaya Zemlya, by Cape Desire. Some of these passages, however, are almost always blocked by ice driven by the wind from the Kara Sea. An ice-free route must be selected.

In the past a vessel would lose time attempting all of these routes in turn, and relying on the boatswain to find the way by observation from the ship's "crow's nest." Now scientific stations have been built at each passage, and by radio they inform the advancing ships of the most convenient route to the Kara Sea. In this sea the steamer often encounters ice floes; but scout planes point out the open channels between the floes and the ship is escorted by an ice-breaker through the solid ice.

In recent years the Kara Sea has been intersected in many directions by Soviet ice-breakers carrying Arctic explorers who have discovered numerous new islands here: Kirov Island, Arctic Institute Islands, "Izvestia" Islands. In 1935 an expedition on the ice-breaker *Sadko* reached $82^{\circ} 41' N.$, thereby breaking the world record for free navigation by an ice-breaker in the high latitudes of the Arctic.

In the eastern part of the Kara Sea, on Dickson Island, a small village, a radio center and an Arctic port have been built

where steamers take on coal being shipped to Dickson Island from Siberia. The rivers Ob and Yenissei fall into the Kara Sea and in their lower reaches fish-canning and lumber mill industries are developing for the first time. A new port has been established beyond the Arctic Circle, Igarka on the Yenissei, situated on the same parallel as the ice floe which held the Chelyuskin camp and already having a population of 20,000. There are large saw mills in the town, which lies 418 miles from the sea but has many sea-going ships come alongside its wharves. Northeast of Igarka the Norilsky Polymetal Combinat is being constructed.

From Dickson Island the steamer sails farther to the east. Here it has to overcome the most difficult part of the journey, where the route from the north doubles Cape Chelyuskin, the northern extremity of Asia, and runs between the mainland and Severnaya Zemlya Archipelago along the rather narrow Vilkitsky Strait. This strait is not ice-free for long, and ships of the Northern Sea Route must pass through it in time. Here again the passage of steamers is assisted by an ice-breaker. With its blunt hull raised, and straining all the force of its engines, the heavy ice-breaker crawls up on the ice field and breaks the ice. The broad sides push the fragments of the ice floes apart and a small strip of open water remains behind. Along this strip the freight ship follows.

To the right is the Taimyr Peninsula, previously known only by its old, inexact descriptions. Study has made it thoroughly familiar.

To the left is Severnaya Zemlya. In the autumn of 1913, the ships *Taimyr* and *Vaigach*, of the Russian Hydrographical Expedition, in attempting to break through the ice floes north of Cape Chelyuskin in the Arctic Ocean, came to the shores of an unknown land. The Russian flag was raised on the coast at the foot of its snow-covered mountains, but the approaching polar winter forced the expedition to depart quickly. They had time to enter on the map only part of the coast of two newly discovered islands. After that a curving line—representing the small piece of coast seen in 1913—was drawn in on the maps of the Arctic Ocean. Perhaps it was the coast line of single islands, perhaps of an archipelago, perhaps of the mainland. The tsarist gov-

ernment did not explore the territory. In 1930, a Soviet expedition, on the ice-breaker *Sedov*, reached Severnaya Zemlya, where a wintering party of four members was landed. During the two years of their life on Severnaya Zemlya the expedition travelled more than 1,864 miles on dog sleds under severe Arctic conditions in order to survey the land. The new archipelago covering an area exceeding 13,900 sq. mi.—larger than Holland—was fully studied, and a scientific Arctic station has now been established on Severnaya Zemlya.

The Arctic steamer has entered Laptev Sea. Here, at Cape Nordvik, coal has been found and rock-salt deposits are being studied. Not far from the mouth of the Lena River a new port, Tixie, has been established. This is a coal base and a port of trans-shipment of freight for the Yakut Autonomous Soviet Socialist Republic from sea-going ships to river vessels. Even now the cost of freight-carrying to Yakutia along the Northern Sea Route is 47% cheaper than by railroad or along the Lena River.

Farther on the steamer passes through the East Siberian and Chukotsk seas, leaving on one side the mouth of the Kolyma River and the New Siberian and Wrangel islands. Soviet settlements have been established on these islands and the inhabitants engage in various industries. A plane flight over Wrangel Island in 1932 led to the making of a new and exact map of the island.

The study of Laptev Sea and of the East Siberian and Chukotsk seas has advanced considerably during the Soviet years. The scientific work of the Chelyuskinites, when they were marooned on the ice floe, was of the greatest importance. A network of scientific stations has been established on the shores, but there is still a great deal of work for the explorer in this section of the Arctic. From here straight towards the north, lies the "pole of inaccessibility," a region of the central polar basin which no one has yet visited.

Having doubled Chukotsk Peninsula through the Bering Strait, the steamer enters the Pacific Ocean. The cargo has been delivered to the Soviet Far East by a route which throughout its course lies within Soviet territorial waters.

TRANS-POLAR AGRICULTURE

Prior to the Revolution the Far North was entirely devoid of vegetation. On the map of Russia stretched a line showing the "border of the region of agriculture," north of which lay an enormous uncultivated territory. On the tundra, in June, ice still lies under the mossy hillocks; the lowlands are swampy; the summer is short, wet and cold. The polar winter lasts for nine months. There are neither towns nor villages, only the infrequent nomad camps of the few surviving native tribes. Cultivation of plants did not exist for the roaming reindeer breeder and fisherman.

The Soviet Far North has now ceased to be a wasteland. Thousands of new inhabitants have settled on the coast of the Arctic Ocean, and during the last six years the population of the Far North has doubled. The awakened north demanded enormous quantities of food stuffs, especially vegetables and milk which contain the anti-scorbutic vitamin "C." Agricultural freight had to be carried along thousands of miles of the roadless north, and this lack of its own agriculture interfered with the progress of this vast territory. Arctic agriculture had to be created, so a series of Far Northern agricultural stations were established: the Khibin Station ($67^{\circ} 44' \text{ N.}$) on the Kola Peninsula; the Pechora Station ($65^{\circ} 27' \text{ N.}$), the Obdora Station ($66^{\circ} 31' \text{ N.}$), the Igarka Station ($67^{\circ} 17' \text{ N.}$), and others. Stones were removed from experimental fields. Marshes were drained. The soil was treated with alkali and supplied with fertilizers, and the necessary bacteria were introduced into the earth. A study was made of the experiences of northern agriculture in other countries, in particular Alaska where Siberian varieties of wheat were utilized by the method of selection. Seed brought from all parts of the world were sown year after year; varieties were selected and hybridized. Seeds were vernalized, and the thermic quality of the soil was regulated.

These efforts were not in vain. There is a lack of heat in the north, but, in compensation, there is much light. In the Khibins, for example, the sun does not set for six weeks in the summer. The Polar North responded to the energy of the investigators by unprecedented harvests.

In the Khibins, on the experimental field, a yield of 20 tons of potatoes to the acre was obtained. Southern varieties of barley and wheat ripened. Oats rose almost to the height of a man and in one year two mowings of fodder grass were obtained. Cabbage, carrots, onions, rutabaga, turnips, radishes, kohlrabi, peas, beans, horseradish, cucumbers, pumpkins, and other vegetables now grow beyond the Polar circle.

Dozens of State farms have been established beyond the Polar circle with the assistance of scientific stations. Vegetable and dairy farming is carried on in the new town of Igarka lying more than 62 miles north of the Polar circle: and here on experimental fields, as much as eighteen tons of rutabaga to the acre have been harvested. In some of the State farms of the Turukhansk District (where the Yenissei crosses the Polar circle) the wheat harvest exceeded 1,760 lbs. to the acre. Stable vegetable gardening has been established in Sakhalin and Kamchatka, and vegetables are cultivated on the gold fields scattered in the Yakut taiga. There are several State farms at the gold fields along the Kolyma river and a scientific and research institute of Polar agriculture and livestock-raising is being established in Igarka.

The geographical limit of agriculture has been extended enormously. The old and the new limits of agriculture can be compared on map 11 (page 55). On Dickson Island (73° N.) Chinese cabbage has been successfully cultivated in open soil; pansies and daisies are growing in flower-beds. Plant life does not die in the hothouses on the Arctic Islands even during the Polar night, and on Dickson Island, mushrooms, lettuce, and cucumbers ripen in April under electric light. Lilac blossoms in winter in the Arctic regions.

THE PEOPLES OF THE NORTH

Scattered over the vast space of taiga and tundra live the comparatively few native peoples of the North, all of whom in olden times were pushed back here by stronger peoples. Reindeer breeding, fishing and hunting are their main occupations.

The Evenki (as the Tungus call themselves) are the most numer-

ous of the northern peoples. They inhabit the taiga belt from the Yenissei to the Sea of Okhotsk.

The Evenks (Lamuts) live on the Okhotsk coast, in the central part of Kamchatka and in North Yakutia.

The Luoravetlans (Chukchi) inhabit the Chukotka Peninsula. They consist of fishermen and hunters who live on the coast, and reindeer breeders inhabiting the interior of the Peninsula. The former lead a settled life while the latter are nomads wandering with their herds.

On Kamchatka live Nyemylans (Koryaks); on the shores of the Arctic Ocean from Mezen River to the Taimyr Peninsula live the Nenetses (previously incorrectly called Samoyeds); in the lower reaches of Ob River, the Mansis (Voguls) and Khantes (Ostiyaks); on the Kola Peninsula, the Saamis (Lapps); in the Maritime Region and on the Amur River (in the Far East), the Nenetses (Golds) and Udes; in the northeast of Yakutia, the Oduls (Yukagirs); on Sakhalin and on the lower reaches of the Amur, the Nivkhis (Gilyaks); on the Chukotka Peninsula, the Eskimos.

Before the Revolution all these peoples were at an extremely low level of development. They were deprived of all political rights, and their economy was distinguished for its extreme backwardness and primitiveness. Stone arrow-heads and spear-heads were still to be found among them. Dealers, usurers, petty princes, and kulaks enslaved and mercilessly exploited the people who were held captive by poverty, sickness and superstition. The peoples of the North were dying out rapidly, the yearly decrease in population of some of them being as high as 10%. In 1859 there were 22,000 Nenetses, while in 1897 the figure had dropped to 16,000. There was a time when there were many thousands of Aleuts in Russia; at the outbreak of the Revolution only a little more than 300 of them remained. Anauls, Ommoks, and Kurills disappeared altogether.

Soviet power has not only removed the menace of the extinction of the Northern peoples, but has brought them along the road of rapid economic and cultural development.

Complete equality between all peoples exists in the USSR, and on Stalin's initiative a Committee of the North, a Government committee to assist the peoples of the Northern borderlands, has

been formed. A body of active and culturally developed persons was educated from among the peoples of the North, and with their assistance steps were taken towards the realization of Soviet national autonomy. National districts were organized on the territory inhabited by the peoples of the North: in the Archangel Region, the Nenets National District (main population, Nenetses; capital, Naryan-Mar); in Omsk Region, the Yamalo-Nenets National District (main population, Nenetses; capital, Salakhard) and the Ostyako-Vogulsk National District (main population, Khantes and Mansis; capital, Ostyako-Vogulsk); in the Krasnoyarsk Territory, the Taimyr National District (main population, Nenetses and Dolgans; capital, Dudinka) and the Evenki National District (main population, Evenkis; capital, Turinsk Cultural Base); in the Kamchatka Region of the Khabarovsk Territory, the Chukotka National District (main population, Luoravetlans—Chukchis; capital, Anadyr) and the Koryak National District (main population, Nyemylans; capital, Palana). Several national districts have been organized for the smaller peoples so that each of the peoples of the North have their territories and their own administrative organization. The economy has been reconstructed so that there no longer exists any social stratum of petty princes and private dealers—the terror of the old taiga. State production and hunting stations supply hunters with improved implements and purchase their produce at high rates. Hunting is conducted on artel (cooperative) lines, and the hunters kill sables, squirrels, foxes, polar foxes, ermines and other fur-bearing animals. In 1936 pelts to the value of 19 million rubles were procured and in 1937 the figure increased to 24 million rubles. Acclimatization of several thousand muskrats, imported from North America, is proceeding on an enormous scale. These animals have been let loose in the forest and have multiplied to such an extent that hunting for them has now been permitted. Acclimatization of the American mink has also been started.

In the past, gardening, and vegetable food were entirely unknown to the peoples of the North. For the first time these peoples are now sowing fodder grasses and planting vegetables. Besides reindeer, they have begun to raise cows. State machine tractor stations, and also mowing machine stations have been organized. In large collective

farms, field work is carried on with the aid of tractors, and usually these tractors are operated by persons from the local community. Mowing and vegetable gardening, supplementing hunting, reindeer raising, and fishing, tie the nomads to permanent settlements and enhance their culture.

In all tribes the birth-rate shows a considerable excess over mortality. For instance, in the case of Evenkis, who were previously dying out, the increase now constitutes according to tentative data over 20 per thousand. In the Ob North the total number of Khantes, Nenetses and Mansis amounted to 25,500 persons in 1913; to 33,600 in 1936.

The outward appearance of the villages and settlements has changed. The people are moving from the old mud huts and reindeer tents to new spacious wooden houses. Cultural bases have been established, a cultural base being a miniature town with a bath-house, a dispensary, a dental clinic, schools, boarding-schools, and shops. Study courses have also been organized at these cultural bases, and, at the Chukotka cultural base for instance, courses have been established for training nurses, motor-drivers and mechanics. Luoravetlans (Chukchis) and Eskimos are attending these courses.

When a hunter or a reindeer breeder arrives at the cultural base, he is provided with food and a bed. He is taken to the museum showing the natural resources and economy of his region. He is shown the workshops, and if necessary his gun, sledge, or clothing is repaired. He learns how to look after the animals in a nursery, how to skin the animal and how to cure the skin, how to stock fish and how to treat sick reindeer. A physician examines the hunter in a clinic and gives him medication if he requires it. The new arrival goes to a bath, visits the cinema and listens-in to the radio.

The peoples of the North for the first time have a written language and can now write in their native tongue as well as speak. Newspapers, primers, and books are printed in the local tongues. By 1935 the Northern peoples already had more than 450 schools including several secondary schools. Technical schools have been opened, and an Institute of the Peoples of the North has been founded in Leningrad. This Institute trains an executive personnel from among the Northern peoples.

Talented organizers are rapidly coming to the front in the North. Take, for example, Tyvlyanto, a Luoravetlan (Chukchi). He was born in a reindeer tent. In his youth he worked as a hired laborer, and in 1926 he was still illiterate. After a course of education he graduated from the Institute of the Peoples of the North, and taking up a leading post he soon manifested his abilities. In 1937 the people of the Chukotka National District elected him as their deputy to the Supreme Soviet of the USSR.

Collective labor brings high earnings, where formerly there was poverty. In pre-revolutionary years the Kosygins, merchants in Anadyr, received a red fox from hunters for one bar of pressed tea and half a pound of sugar; for a pair of walrus tusks they would give two bars of pressed tea and one pound of sugar (in Japan and America the value of the tusks was \$14). In the winter season of 1937-1938, the Treusov brothers, fox hunters of the Morzhovaya wintering station, the Sysoyev brothers of the Ugolnaya wintering station, and Baikov and Yemeljanov of the Polynya wintering station earned from 15,000 to 30,000 rubles each. Akim Nyrenko, a Nenets from Novaya Zemlya, earned 24,000 rubles in that year, and Sleptsov, a hunter from the New Siberian Islands, earned 42,000 rubles.

The physical and cultural life in the Far North has changed beyond recognition within a short period. Furniture, sewing machines, gramophones, and bicycles now are common amenities of every-day life in the taiga and tundra, among peoples who formerly knew only fear and starvation.

Take the village of Temtor in the Yakut North. In 1926 a school was built there. In 1931 the "Bolshevik Collective Farm," consisting of 105 households, was formed. Reindeer yards were built. The people moved from nomad tents into houses. Now a kindergarten has been established. Illiteracy has been abolished. Under the direction of Vinokurova (a Yakut woman), a vice-chairman of the managing board, this collective farm, is overfulfilling its plan of pelt collections by 200% to 400%. For her Stakhanovite work this woman has been rewarded with a trip to Moscow and to the Crimea, where she spent her vacation in one of the best health resorts.

THE CONQUEST OF THE NORTH POLE

In the summer of 1937 the Soviet pilots Chkalov and Gromov made two remarkable flights from the USSR to the United States via the North Pole. (See airways route on Map 20, pp. 188 & 189.) In the same year a drifting Soviet Polar Station was organized in the region of the North Pole.

In the spring of 1937, an expedition of 41 persons set out in four large planes which landed simultaneously at the Pole, and the drifting Polar Station was opened on May 21st. The wintering party of the station consisted of Papanin, chief of the station, Krenkel, radio operator, Shirshov, hydrologist, and Feodorov, astronomer and magnetologist. The total weight of the goods (scientific instruments, food, and fuel) brought to the Pole exceeded ten tons. The camp was set up on a large ice floe exceeding 10 feet in thickness and the flag of the Soviet Union was hoisted on the North Pole.

The ice floe rapidly drifted away from the Pole in the direction of the Sea of Greenland. On February 1, 1938, as a result of a six-day storm, the ice floe broke, but the wintering party did not stop their scientific work until February 19th when, in the region of 70° 54' N. and 19° 48' W., the four men and the entire load on the ice floe were taken aboard the Soviet ice-breakers *Taimyr* and *Murman*. The Papaninites had lived on the ice floe for 274 days, floating with it a distance of about 1,554 miles and fully accomplishing all their scientific tasks. The drift of the station can be seen on map 20 (pp. 188 & 189).

The scientific labors of the drifting station are of tremendous importance, and have given the world much that is new.

Until the Papanin drifting expedition took place, the depth of the Arctic Ocean at the Pole was only known to be not less than 8,996 feet; at that depth the cable broke when Peary attempted to sound the Ocean after reaching the Pole in 1909. The Papaninites were the first to determine that the depth of the Ocean at the Pole is 14,075 feet, proving the Arctic Ocean to be very deep. The supposition of the existence of dry land in the region of the North Pole was finally proved to be groundless.

Papaninites established that at the North Pole itself, a warm stream coming from the Atlantic Ocean flows at a depth ranging from 820 to 1,969 feet. The temperature of the water of the Atlantic is above 32° F, which means that water, warmed by the hot sun of Central America, reaches the North Pole.

Hitherto, it was believed that there was no life in the central part of the Polar Basin. The Papaninites established the fact that life continues in the region of the North Pole. Solar rays penetrate through the melting ice floes at a depth of some 66 feet and give rise to the most varied manifestations of life. In the water, even at a depth of 2 miles, seaweed and various forms of life—small crayfish, larvae, worms, etc., were found. Here and there unicellular microscopical seaweed evolved on the ice, staining it a yellowish-red color. Among the larger animals observed in the region of the Pole were birds (pipits, sea-gulls, guillemots), bearded seals (a species of seal), seals, and white bears with their cubs.

Previously it was believed that there was a circular sea current in the Polar Basin. It was proved that the direction of the drift of the ice floe from the Pole was straight towards the South, towards the eastern coast of Greenland. The velocity of the drift unexpectedly proved to be exceptionally rapid. At first the ice floe travelled between 2 and 2½ miles a day; subsequently its daily velocity increased to 12½ and more miles.

There was a theory that a high atmospheric pressure is constantly maintained in the region of the Pole and that the weather, therefore, does not change much there. The Papaninites established that this is not so. Strong cyclones burst into the region of the Pole and cause fluctuations of the temperature. It was found to be warmer at the Pole than was previously thought; at the Pole no such low temperatures occur as are registered, for example, in Yakutia.

Magnetic observations were conducted which made it possible to prepare a magnetic chart of the Arctic that will facilitate the use of the magnetic compass, and consequently, the navigation of airplanes.

The radio station of the Papaninites worked without a hitch all during the drift, receiving and transmitting nearly 3,000 radiograms.

It facilitated the flights of Chkalov and Gromov over the Pole by transmitting meteorological reports to them every three hours.

The Arctic scientific stations that previously existed were situated along the borders of the Arctic Ocean, never penetrating the North Pole territory. Now that region has been explored. The bold idea represented by the Papanin expedition, so far-reaching in its effects, was realized efficiently, calmly and fruitfully. The entire work of the drifting station was distinguished by its remarkable courage and optimism. In contrast to hitherto prevailing opinions, it has now been proved that heavy airplanes can land on the ice of the Central Arctic; that there is warm water under the ice; that the North Pole is not a biological desert.

There is now drifting in the Soviet part of the Central Polar Basin, from New Siberian Islands in the direction of the North Pole, the icebreaker *Sedov* with a party of 15 people who are conducting scientific research work. The icebreaker has already passed latitude 86° north, thus having broken the record established by Nansen's *Fram*. By the middle of March 1939, the *Sedov* was about 250 miles from the Pole. The direction of this drift can be seen on map 20 (pp. 188 & 189). The *Sedov's* scientific study of the Central Polar Basin is a continuation of the work of Papanin's drifting station.

THE SOVIET FAR EAST

When it is morning in Moscow, it is already evening in the Khabarovsk and Maritime Territories of the USSR which lie on the Pacific Ocean, and form the Soviet Far East. This distant province, where a thrilling struggle is in progress for the mastery of vast natural resources, is very popular with people all over the country. They are doing their utmost to further the rapid development of this region, and thousands of young people write to the organizations in charge of construction here asking to be transferred to work in this pioneer land.

Within the borders of the Soviet Far East, which is 1,081,000 square miles in area, over half of Western Europe could be contained. It extends from the frontiers of Korea in the southwest, to Alaska in the northeast, a distance of 2,800 miles. No other country on the

Pacific Ocean possesses so long a coast-line. Its northern outskirts—the Okhotsk coast, the peninsulas of Kamchatka, and Chukotka—maintain contact with its southern end—the Amur and Maritime regions—not overland but by sea.

The Far East is a highland region. There are plains only in the south, in the vicinity of Lake Khanka (1,525 sq. mi.) and in the west, where the Zeah and Bureah fall into the broad river Amur. The Amur, together with the Argun, is 2,780 miles long. The rest of the land is filled with the spurs of mountain ranges: the Maly Khingan (more than 6,560 feet high); Sikhoteh-Alin (about 6,560 feet); Kamchatka (up to 16,000 feet) and others. For the most part the mountain ridges of the region lie parallel to the coast, from southwest to northeast.

Except for its Arctic section, the Far East lies in the monsoon zone. In summer the wind brings warm rains from the ocean, the mountain summits are hidden in the clouds, the coast is shrouded in mist, and the rivers overflow. In winter Yakutia has a dry frost. There is little snow and the weather is cold, the sky clear, and the sun bright. The autumn is the best season of the year, long, mild, and sunny, with extraordinarily brilliant and variegated foliage.

In Vladivostok ($43^{\circ} 7'$ North latitude; $131^{\circ} 53'$ East longitude) the average temperature for July is 65.4° F. and for January 6.5° F. Rain falls chiefly along the mountainous coast: in the Vladivostok district, 30 inches; on the south-eastern coast of Kamchatka reaching 39.4 inches.

The immense area and divisional character of the Far East accounts for its extreme variety. In the north is the Arctic tundra. In the central regions are boundless conifer forests with a mixture of foliage trees. In the south there are Siberian and Manchurian species of both flora and fauna: the northern fir is twined about with liana, moss grows side by side with the lotus; the sable encounters the tiger.

The Far East is exceptionally rich. It possesses huge deposits of coal (one on the Bureah, another in the Vladivostok district, a third in Sakhalin, a fourth in the Khingan range); oilfields (in Sakhalin and Kamchatka); iron ore (in Maly Khingan); gold (on the Zeah, the lower Amur, and the Kolyma); zinc (near the Bay

of Tetiukheh in the Maritime region); rare metals (in the Amur region). Valuable timber grows in the forests: cedar, cork and larch. There is an abundance of fish, crabs, and other marine animals.

Under tsarism, the Far East did not have its own economic base, and its economic structure was one-sided and backward. Nearly everything obtained here was sent out of the region, and nearly everything required by the region was brought from outside. Manufacturing was practically non-existent and the produce of the region was taken out in raw form. The few industries which existed were run in a predatory fashion. The finest species of trees were cut down to the great damage of the forests. The hunting of fur-bearing animals and fishing were subject to no control, thus preventing ~~their natural~~ renewal and exhausting these resources. More than half the ore remained untouched in the exploited portions of the gold mines.

Today the region has undergone a complete transformation. The old branches of the mining industry have been thoroughly reorganized. The coal pits and gold mines are rapidly being mechanized. To the extraction of raw material has been added the manufacture of finished products. The trees are not only felled but are cut up in the new saw mills. Selective felling has been replaced by the more rational method of clear felling. Forest roads are being constructed, and lumber output has increased more than tenfold compared with pre-revolutionary times. Motor vessels are replacing fishing smacks in the fishing industry. New species of edible fish, such as ivassi (a variety of sardine) are caught. Protective restrictions have been introduced into fishing and hunting. Fish hatcheries release millions of young fish annually, and exploration of the northern seas has led to an increase in the catch of valuable salmon, such as the Siberian salmon, the humpbacked salmon and others. The catch is prepared in new salting and preserving plants, of which there are a large number. A quarter of the fish products of the USSR come from the Far East.

New branches of industry have been created: machine-building, ship-building, oil extraction and refining, and sugar refining. New electric power stations have been constructed. Ferrous metallurgy

is being developed; and new mills, mechanical bakeries, clothing factories and agricultural produce factories are now in operation. During the years of the Second Five Year Plan the number of enterprises of large-scale industry in the Far East doubled, while the whole of industrial and transport construction increased ninefold. During the Second Five Year Plan period, the coal extraction in the Khabarovsk Territory increased fivefold, the oil extraction twofold, and the whole economy of the Maritime Territory grew at a similarly rapid rate. The Soviet Far East is thus strengthening its own industrial base.

The agriculture of the Soviet Far East has been socialized and mechanized. Ninety-seven percent of the peasant farms have united in collective farms. Combine harvesters can be seen at work even in the fields of distant Sakhalin. During the Second Five Year Plan period the number of tractors in the Khabarovsk Territory has increased almost twofold, the number of combines fivefold, the number of trucks in agriculture more than tenfold. New lands have been cleared in the taiga, drained and tilled. The development of horticulture on an extensive scale has begun.

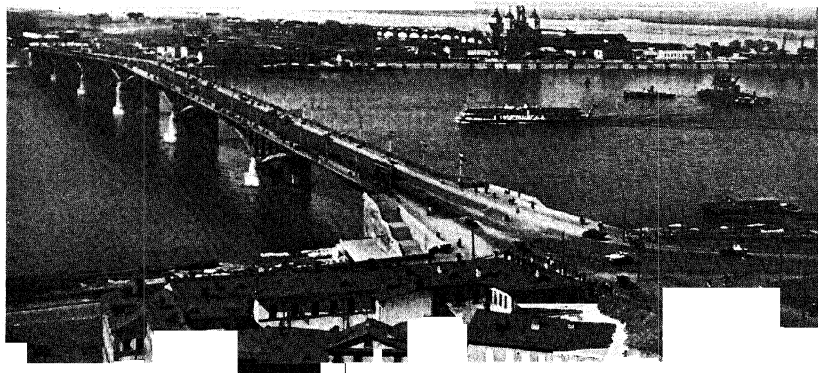
The transport of the Far East has been reconstructed and improved. With each year the distance of the region from the central part of the country is shortened and the capacity of the Trans-Siberian Railway has been increased by the laying of a second track over a distance of close to 1,864 miles. A second railway in the Far East, the Baikal-Amur line, is under construction. The Far East is connected with the western part of the country by still another route: a sea route which lies entirely within the borders of the USSR, the Northern Sea Route. Soviet aviators have reduced flying time from Moscow to the Far Eastern frontier to twenty-four hours.

In order to cover the distance between Transbaikal and the Khabarovsk territory, the Trans-Siberian Railway, on leaving Chita, has to cut through a wild and mountainous district, not far from where the Shilka and the Argun meet and form the Amur. From there it is still 932 miles to the Pacific Coast; and past steep bluish mountainsides, through virgin taiga, the transition to the Soviet Far East is made. Here we come upon the typical Far Eastern scene



The new "Square of Fallen Heroes" in Stalingrad on the Volga

The Oka Bridge and Volga River at Gorky





Fishing in the Ussuri
River, Soviet Far East

Nenetses of Khabarovsk Territory sewing native costumes



of today: advanced technique, through the efforts of the whole country, placed face to face with primitive nature.

The single-track railway was recently replaced by a double-track line. In actual fact this was tantamount to the construction of a new railway, for the second track was laid at the side of the old one only after the ledge of rock had been widened. Fresh traces of the automatic drill can still be seen on the rocky slopes. Mounds of soil dug out of the hollows and tunnels have not yet grown over with grass. High new bridges cross the mountain rivers side by side with the old. At the larger stations, amidst the mountain heights, flat shunting spaces have been constructed out of soil brought for the purpose. Water-pipes, which function without interruption, have been laid in the Rukhlovo district, where in winter the rivers freeze to the bottom. Water-towers, engine sheds, and dwelling-houses have been erected by new methods to preclude the deformation of buildings on the eternally frozen soil, on sites which bulge in winter. Workers' settlements have sprung up near the stations. Thus the surrounding taiga has become merely the background of thriving industrial centers.

The line descends into the valley of the Zeah. The conifer forest disappears together with the mountains and eternal frost. In the warm climate here, solitary foliage trees—limes, birches, and Manchurian oaks—are scattered about the plain.

The plain in the valley of the Zeah, between the railway and the Amur, has long ago been cleared of the forest and plowed. This is the steppe region of grain, the wheat granary of the Far East. In color and fertility the earth resembles black soil; collective farm fields, free of all boundaries, extend as far as the eye can see. Motor-cars run along the new roads; the finest buildings are occupied by schools, field-laboratories, and the collective farm administrative offices; hundreds of houses for settlers from the central regions of the Soviet Union are being constructed. Mail is distributed to the larger villages by airplane. Soy beans are being planted for the first time, in addition to wheat. Deep plowing on the Amur plains by means of tractors leads to the creation of a richer, and at the same time a structural, stratum of humus.

The industrial and cultural center of this wheat belt is Blagovesh-

chensk, which lies at the point where the Zeah enters the Amur. Five storied brick mills rise above it.

To the east of the Zeah plain, beyond the Maly Khingan range, lies the Jewish Autonomous Region (14,200 square miles).

Before the Revolution of 1917 the Jews in Russia, except for a few strictly regulated exceptions, were deprived of the right to engage in farming and to live outside the boundaries of the official "pale." The Jews were restricted to one profession (handicraft and trade), and compelled to live in the narrow territory of Western Ukraine and Byelorussia.

These medieval customs were abolished from the very first moment of the Revolution. In addition the Soviet Government has since been organizing and facilitating the settlement of Jews on the land, providing them with territories in the Ukraine, the Crimea, and the Far East. Tailors and cobblers, inhabitants of the overcrowded small towns of the west, are becoming farmers. Hundreds of thousands of Jewish working people in the USSR have been drawn into agricultural production.

On the banks of the Bira and Bijan, the left tributaries of the Amur, at the spot where the wooded mountains of the Maly Khingan range meet the rich and fertile plain, there has been created a region of voluntary Jewish settlement—Birobijan. The Jews here are engaged in mechanized agriculture. Between 1928 and 1936 the sown area increased two and a half times. But there is no agrarian one-sidedness. The skillful hands of the one-time artisans who have now become workers have laid the foundations of Far Eastern light industry. The economic and cultural development of the Birobijan national region led to its proclamation in 1934 as the Jewish Autonomous Region.

A once almost desert land has been adapted to intensive living.

To the south, along the Amur, lay a chain of sparse Russian settlements. The north was crossed by a railway, but it was of importance merely as a means of transit. No one, except the conductors, had heard of the flag-stations in the taiga, Tikhonkaya, Londoko, Birokan. The central part of the region, between the Amur and the railway, was entirely unexplored.

With the progress of Jewish colonization Tikhonkaya became

the town of Birobijan, a large lime-works was constructed at Londoko, quarrying of marble began in Birokan, and salmon-breeding was started at the Lake Tioploye fishery. Immense deposits of iron ore were found at Kimkan, a railway settlement sprang up in Obluchye, a health resort was created at Kuldur, gold-mining was begun at Soutar and timber cutting in the taiga. Jewish collective farms sprang up along the Amur. The old site is a flat, humid and fertile plain at the foot of the Maly Khingan mountain range, with here and there scarcely discernible hillocks, covered with oak shrubs, and in the south the distant horizon enclosed by the mountains of Manchuria.

The old Russian agriculture on the Amur developed on the "riolki," the dry oval islands scattered about the humid plains. Today the whole character of the landscape is changing. The broad lowlands are being tilled for the first time; and although this requires skillful agricultural technique, these lands are suited to machine cultivation.

Drainage canals have been cut in the cultivated tracts. The oak-woods on the hills have been uprooted. The virgin soil has been plowed, and wheat, oats, potatoes, and vegetables planted. The first orchards have been laid out. Whole detachments of tractors can be seen at work, and soy beans are being gathered for the first time by means of harvesting combines.

New villages are springing up, with clean houses of fresh-hewn timber standing in long even rows on the residential streets. Surrounding the "economic center" are the village shop, the medical station, and the school; and in the background the pig pens, cow shed, stables, granary, and barns. All this resembles a model village, but it is a typical collective farm village, built by the State for Jewish settlers.

For example, take the collective farm "Waldheim," where a rich harvest was obtained in 1938. In some parts there was a yield of 25 tons of potatoes per hectare ($2\frac{1}{2}$ acres). Over a ton of raspberries were gathered; apples, plums and a large quantity of honey, the yield of honey being greater in the Far East than in any other part of the Soviet Union. The best cows in the farm gave over 800 gallons of milk a year. A large sum of money was realized from the

sale of vegetables. This collective farm has an excellent clubroom, a model kindergarten, a creche, a large library, a surgical and maternity station, and a secondary school, in which the pupils are taught both in Russian and Jewish. Its personnel includes doctors, zoological technicians, agriculturists, and teachers.

The capital of the Jewish Autonomous Region is the new town of Birobijan, filled wherever you turn with buildings in process of construction, piles of rafters, new brickwork. Already there are an electric power station, a clothing factory, a furniture factory, a plywood factory, a factory for building trim, a repair and machine shop, and a mechanized bakery. A hospital, a printing shop, and a hotel have also been completed, as well as technical schools, and a School of Music and Ballet. The town's library contains practically every Jewish language work published in Russia, and every Russian publication about the Jews since the second half of the 18th century. Jewish newspapers are issued here, and there is a State Jewish Theatre that opened the autumn season of 1938 with the play "Uriel Akosta," which is also in the repertoire of the State Jewish Theatre in Moscow. The town is growing so fast that while the new large station was still in course of construction, it had already become too small. The auditorium of the theatre has also become too small, so a new theatre, where a Russian branch is to be established, and a new library building, are now being erected.

Leaving behind it the Jewish Autonomous Region, the railway approaches the chief town of the Khabarovsk Territory, Khabarovsk, which lies on the right bank of the Amur.

The Amur is so wide here it resembles an elongated lake; and during the summer months, when the river overflows the sloping bank opposite the city, the flooded land stretches as far as the eye can see. Work in the river port proceeds without interruption day and night. White motor vessels sail up and down the river, tugs tow barges, cutters dart to and fro.

Densely populated Khabarovsk possesses new machine-building works, theatres, medical and pedagogical institutes. The principal streets lie along the high crests of an undulating hill, the inhabited quarters nestling in the low hollows. Huge new many-storied build-

ings have been erected on the ridges, and from above the town they resemble skyscrapers.

The main street terminates above the Amur in a high asphalted plateau known as Komsomol Square. Looking over the parapet, one can see the distant sandbanks, the wooded plains of the river-side, and Mount Khekhtsira showing blue on the horizon. The general aspect of this town is typical of Far Eastern scenery.

There used to stand on the Lower Amur a Russian fishing village, squeezed against the sloping left bank of the river by the fir taiga. Like every Amur village it possessed a street of dark huts, a tiny wooden church, store-rooms on low pillars, rods with nets, dried salmon on the walls. Close at hand was a settlement of Nenetses (Golds). The mountains open out just here, exposing a large level tract of land, and at this convenient site the taiga has now been uprooted and the foundations laid for a machine-building, ship-building, and metallurgical town named Komsomolsk-on-the-Amur.

The town is being built near its gigantic factory buildings. Street after street has been laid. The fishing huts have not yet been pulled down but they are being crowded out by whole districts of many-storied stone buildings. Rows of new wooden houses stretch towards the distant mountains. The earth has been dug up, logs heaped up, and rails laid. One can scarcely locate in the midst of the high new buildings, the spot where six years ago stood the mud-huts of the first Young Communists (Komsomols), who were the founders of this town.

A new railway now connects Komsomolsk with the main line. There are technical schools, more than twenty elementary and high schools, a sports stadium, and aquatic sports stations built for the town's scores of thousands of inhabitants of whom 70% are young people. This is known in the Soviet Union as "the town of youth," and it is considered an honor to work here. Rising above the houses and factories is a huge wooden tower of original design which is the highest parachute tower in the country. It symbolizes the daring of these young pioneer settlers.

Below Komsomolsk, near the mouth of the Amur, is Nikolaevsk. In the autumn, great schools of salmon pass here on their way up

the river to spawn and die; and from the deck of a vessel one can see thousands of them splashing in the flooded waters.

Fisheries, refrigeration plants and workers' settlements have sprung up in the Nikolaevsk district. A technical school has been opened for the peoples of the North and newspapers are published in the Nivkh (Giliak) as well as the Russian language.

Nikolaevsk is connected with Khabarovsk by a regular air line; and from Khabarovsk to the South, a railway leads to the Maritime Province.

Industry has greatly changed the old town of this Maritime region. In Spassk is a huge cement works. In Voroshilov (formerly Nikolsk-Ussurisk) is a sugar-refinery and an oil and fat works. Many new towns have sprung up like Bikin and Lessozavodsk; and the very fields have changed, with the aid of machines, so that on the plains around Lake Khanka they are now raising such unfamiliar crops as rice, perilla (an herb) and sugar beets.

In the depths of the Sikhoteh-Alin Mountains lies the primeval Ussuri taiga which is a virgin jungle. The majestic cedars are hidden by impenetrable thickets of cork-oaks, elms, black birches, and Amur lilac. Twined about the trees are rope-like lemon grass and wild vines, and the mark of the tiger can be seen on the sand near the river. Modern life is penetrating even here. New roads are being cut in the taiga, new villages are springing up, minerals are being discovered and worked. You step out at night from a tiny hunting box into the deep mountain taiga and hear the owl screeching in the forest and airplanes droning above. In the past the search for the medicinal "root of life"—*zhen-zhen*—was a secret known only to the pathfinders; but today there are experimental plantations growing *zhen-zhen* in the taiga.

The broken sea-coast, covered with wild vegetation, is full of activity. There are many new coal pits in Souchan and Tavrichanka, and a large miners' town has been born. Electric power stations have been constructed. Flotillas of motor fishing boats lie off the docks of the fisheries, new canning factories are in operation, and airplanes participate in the search for schools of fish. Workers in diving dress collect valuable seaweed from the bottom of the sea. In Sedima and several other places, spotted deer are bred

in special fenced parks, and once a year the horns of the males, the so-called "panti," are sawed off and used for preparing a highly valuable medicine. The fur trade also is carried on here in the sea islands, the Isle of Poutiatin, for example, specializing in the breeding of silver foxes.

The chief town of the Maritime Province is Vladivostok. Round the noisy port with its innumerable ships the town lies like a steep amphitheatre, with row upon row of orderly streets whose houses at the back seem to stand on the shoulders of those in front. Throughout the summer the stone pavements are wet with moisture from the sea.

Ships sail from Vladivostok to Kamchatka and the Arctic regions, and to the island of Sakhalin whose northern half, 15,700 square miles in area, belongs to the Soviet Union. Alexandrovsk is its chief town.

Sakhalin used to be the most terrible spot in the Russian Empire. It was a penal colony, and exile to this distant island was looked upon as a living death.

Today, cutting machines and pneumatic hammers are at work in the coal passages which were formerly dark subterranean caves but are now lighted by electricity. Motor boats have replaced fishing smacks at the fisheries, the fish are now being preserved and salted in refrigerators, and within the same Five-Year-Plan period the fish catch more than doubled. Lumbering and the building of wooden ships are two newly established industries, and timber collections have increased fourfold since the industry started. Before the Revolution, oil extraction was unheard of in Sakhalin; and even in recent years all Sakhalin oil extracted at the new fields of Okha was exported, while oil products were brought by sea from the Caucasus via three oceans. Today Sakhalin oil is sent down the Amur to a new works in Khabarovsk, where primary distillation is combined with the cracking process.

Mechanized agriculture is developing, particularly in the raising of vegetables. Here, for example, is what has happened in a few ordinary villages of this remote land. At Kirovskoye village there is the agricultural collective farm "Soviet Sakhalin." It has two schools, a hospital, a veterinary station, a home for invalids, and

a kindergarten. It has built new stables, a new pigsty, a new vegetable storeroom, and two new cattle sheds; possesses a field laboratory, and has purchased a motor lorry.

The Nivkh (Giliak) collective farm, "Chir-unvd" ("New Life") is composed of Nivkhi, aborigines of Sakhalin, who were once one of the most backward peoples of Russia and rapidly dying out. Now their population is increasing. Formerly the Nivkhi lived in mud-huts. Now the State has built comfortable houses for them, and all life is new in "Chir-unvd." For the first time fishermen are working on the land, working together in the collective farm which owns over 124 acres sowed to crops; cows; horses; and tractors which are operated by the Nivkhs themselves. Among twenty-one families, fourteen have bought gramophones. Their earnings amount to thousands of rubles, and all that remains of olden days is the hanging "*youkola*" (sun-dried fish). Even that is not to be found in every home. The ancestral bows and arrows remain in a corner of the room, but they are kept only for use in sport.

The fishing collective, "Eastern Sea," possesses three motor boats and several barges. Its members live in houses of modern design, furnished with previously unknown articles of comfort such as a spring mattress, a sewing-machine, and bookshelves. Bicycles can be found in many homes. In the club there is a stage for the performances of the dramatic society; a library, a wall-newspaper, and an orchestra of native stringed instruments.

From 1925 to 1936 the population of Soviet Sakhalin increased more than tenfold.

In former times, weeks were spent in a journey from the railway to Sakhalin in winter. Today a passenger plane covers the distance from Khabarovsk in four hours. Thus the notorious isolation of the island has disappeared with the past.

To the northeast of Sakhalin, between 51° and 60° north latitude lies the peninsula of Kamchatka, a highland country with volcanoes, hot springs, and virgin forests. There are 19 active volcanoes, the highest being the Stari Svet Volcano on the Kluchevsky hill, 16,000 feet high. This is the highest volcano of the Old World. In 1935 explorers who ascended this active volcano succeeded in descending the crater (825 to 1,000 feet in diameter, and 165 feet

deep) and safely avoided the danger of the red hot shower of burning coal flying from within.

Fish are caught in the waters off Kamchatka and preserved in local canning factories. From the west coast of the peninsula comes the greatest part of the world's crab supply, which is preserved by floating canning factories. Whales are found in the neighboring waters. Agriculture is developing in the valley of the Kamchatka river. Valuable fur-bearing animals, such as sables, red foxes, and ermine, inhabit the Kronotsk Preserve, which is a wooded mountainous district in the heart of the peninsula covering an area of 3.7 million acres—larger than Yellowstone Park.

The chief town of Kamchatka is Petropavlovsk, which has recently become a port. The cultural advance of this section is illustrated by the fact that before the Revolution there were thirty schools, while in 1938 there were two hundred seven.

To the east of Kamchatka, in the Bering Sea, lie the Komandor Islands, famous for their seal colonies.

Chukotka lies to the north of Kamchatka, close to Alaska. This is a Far-Eastern Arctic territory engaged in deer-breeding and the capture of marine animals, and also the site of a number of polar stations.

The river Kolyma (about 1,250 miles long) flows into the Arctic Ocean. Its basin faces north and is enclosed by mountains in the south. Yakuts, Oduls (Yukagirs) and Russians formerly lived in the occasional villages in the middle and lower parts of the Kolyma, and it was a backward and impoverished corner of Siberia. The harsh oppression of the local petty princes was aggravated by the isolated character of the valley. The thousand-mile-long paths from Yakutsk, made by beasts of burden, had fallen into a state of disuse. The Arctic Ocean was dead.

Traders laid a winter deer path in the Upper Kolyma region from Ola on the coast of the Sea of Okhotsk, in the south. They monopolized this "Ola path" and reduced the whole of poverty-struck Kolyma to a state of semi-starvation, bringing into the region just enough corn to maintain the maximum price of bread.

The inhabitants were obliged to feed on larchwood and their terrible poverty gave rise to a widespread mental disease known as

"meriachenyë," a form of hysteria. There had been a time when the "smoke of the Oduls' bonfires hid the twinkling of the stars," but under tsarism the people were dying out and by the time of the Revolution no more than five hundred Oduls remained.

The Soviet regime has freed the people of Kolyma from the traders and petty princes. The Northern Sea Route has opened the gates of the Kolyma in the north so that bread, kerosene, textiles, and many articles of culture pass through the mouth of the river into the valley. Yet the problem of Kolyma was not completely solved because the voyage from Vladivostok to Bering Straits to Ambarchik Bay (at the mouth of the Kolyma) was made only once a year.

The situation became more critical when huge deposits of gold were found at the upper part of the river and their development began. So a motor road was laid across the mountains from the Okhotsk coast to the river and this altered everything: Kolyma began to turn toward the south instead of the north, and the map of transport communications was reversed.

Before this was done, however, the physical map had already been altered. For several decades the map of Siberia had shown within the arc supposedly formed by the Verkhoyansk and Kolyma ranges, radial mountain chains at right angles to these ranges dividing the Kolyma and the Indigirka which flowed to the north. Geographical exploration, begun in 1926, altered this conception of the topography of northeastern Siberia. There are no mountain ranges at right angles to the Verkhoyansk range, but parallel to the latter is the huge Cherski range, recently discovered which extends for 621 miles and rises to a height of 9,843 feet. The Kolyma and Indigirka do not flow between the mountains but cross the range in the narrow valleys formed by geological faults in the strata and here gold is visible in the granite. The Kolyma range does not meet that of Verkhoyansk, nor does it stand like a steep barrier between the Upper Kolyma and the Okhotsk coast. The river runs much nearer to the Okhotsk coast than was shown in the old maps . . .

A port was created a few years ago on the north coast of the Sea of Okhotsk, in the Bay of Nogaëvo with moorage artificially filled in under the steep rock. Here ocean-going vessels of the

"Dalstroy" (Far Eastern Construction) trust lie at anchor. Behind a low rocky hill overgrown with larches, sparse and stunted, resembling the delicate black lines of an engraving, stands the newly built town of Magadan. In its streets one may still come across stumps from the taiga, but the town possesses an electric power station, motor-repairing and wood-working factories, technical schools, houses with bathrooms, a park of culture and rest, printed newspapers, a literary magazine, libraries, a theatre and a museum, which is visited by almost three hundred persons daily.

Barren and gloomy mountains overlook the town. There are State farms around Magadan, separated only by a couple of hundred miles from the pole of frigidity. Here the forest is uprooted. Steel ropes are tied to the larches and caterpillar tractors tear the trees out of the ground. The moss is pulled out of the soil by machines and the land is tilled and harrowed several times. Thus a cultivated tract is formed and vegetables and fodder grasses are sown in the cleared ground.

Agriculture lends a new aspect to the scenery immediately. The cleared fields are divided into beds, the glass of greenhouses sparkles in the sun, chickens run about the State farms in the fenced-off taiga, between tree stumps and larches; and the transformation of this section "from a consuming to a producing region" is vividly portrayed before your eyes.

From Magadan the Kolyma automobile road runs straight as an arrow for hundreds of miles through the mountains in a northerly direction. These mountains are covered with a sparse taiga, through which one can see for long distances because the green larches with their dark scale-like bark have in their midst many grey and almost transparent branches of dead wood. The car rushes along the smooth road which is marked with signals and speed indicators. Rivers choked with pebbles flow at the bottom of the valleys. They are walled with rock and spanned by bridges perfectly level with the road so that the car passes over them without a jolt. You come to miry peat-bogs in the depths of which geological ice is concealed and the road passes through these bogs over tens of thousands of unseen logs. There are so many berries that the grass looks either red or blue. Columns of lorries, tractors with trailers, passenger

omnibuses, motorcycles and steam-rollers travel along the road. The whole road is dotted with repair shops and refreshment stands for the drivers. Gas stations are met with every thirty miles along the road. The bent roots of fallen trees emerge from the mire, and charred and rotten stumps lie all around. Water trickles down the slopes in which the layer of eternal ice is revealed. Electric wires are carried through the mountains on iron poles. The mountainsides are overgrown with Iceland moss. From the motor road one sees airdromes, meteorological stations and chemical laboratories. The white cotton-wool of the *veinik* (calamagrostis) is borne by the wind. Mines, ore-concentration works, hydro-electric stations have been constructed in the heart of the mountains. A forest can be seen blazing in a distant ravine. The road passes through new towns and villages with log and brick houses, garages, schools, and cyclists. At the roadside stand boards bearing the names of the towns—"The Town of Atka"—"The Town of . . ."

This is the territory the motor-road crosses, a territory which yesterday possessed no map. The landscape has been improved by the line of this smooth, straight motor road. The swampy taiga, confined within boundaries, has lost its wild character. You can measure the culture of a region by the occupations of its people, and this section, which four or five years ago saw only the lone squirrel hunter facing this untamed wild, now displays posters in towns all over the Soviet Union bearing the following inscription: "Dalstroy requires mining engineers and technical experts of all kinds, blasters, hydraulic engineers, hydrologists, builders, power engineers; electricians, ship-builders, electrical engineers; technologists in ceramics, cement production, and motor repairs; mining mechanics; designers of electric power plants, unpaved roads, petrol reservoirs, petrol pipes, and wireless telegraphy; production regulators in mining and boring; prospectors, geodesists, geologists, topographers, soil investigators, agriculturists, synopticians, meteorologists, jurisconsults (legal advisers), master borers, mining overseers and foremen, collectors; doctors, oculists, bacteriologists, therapeutists, surgeons, veterinary surgeons and veterinary assistants; economists and planners in the mining industry; chief bookkeepers of administrations, senior bookkeeping inspectors, methodological

and analytical bookkeepers, senior bookkeeping instructors, chauffeurs of gas-generating machines, managers of industrial enterprises, managers of food warehouses, pisciculturists, instructors, naval and coastal wireless operators, postal and telegraph workers of every specialty."

The Ukrainian Soviet Socialist Republic

THE Ukrainian Soviet Socialist Republic plays an exceptionally important part in the national economy of the USSR. Occupying one-fiftieth of the area of the USSR, the Ukraine has approximately one-fifth of the population and produces one-quarter of the country's grain, two-thirds of its sugar, over three-fifths of its pig iron, half its coal, half its salt, one-fifth of its machinery, one-fifth of its chemical products, and is responsible for nearly one-third of the railway goods turnover of the entire Soviet Union.

The Soviet Ukraine combines a well-developed agriculture with a well-developed industry. In population and economic power it takes second place among the republics of the Soviet Union, the Russian Soviet Socialist Republic being first. This broad and immensely rich territory lies in the southwestern corner of the USSR, between the Polish-Rumanian frontier in the west and the Black Sea in the south. Its area is 171,950 sq. mi., and it is divided into fifteen administrative regions.* Within its borders lies also the Moldavian Autonomous Soviet Socialist Republic; and in addition to this people and the Ukrainians, the Republic is inhabited by Russians and Jews and other races making up a total population of more than thirty million. For density of population this Republic takes first place in the Soviet Union.

The Ukrainians are a people with a rich historical past. A thousand years ago Kiev, the capital of this republic, was the capital and center of a great State—Kiev Russ—which united various Slav tribes, formerly dispersed and scattered, into one single state. The

* The Regions of the Ukrainian SSR are named after their chief towns; Kamenets-Podolsk, Zhitomir, Vinnitsa, Kiev, Kirovograd, Odessa, Nikolayev, Zaporozhye, Dniepropetrovsk, Poltava, Chernigov, Soumi, Kharkov, Stalino, and Voroshilovgrad.

Slavs subsequently separated into three branches: Russians, Ukrainians, and Byelorussians.

In the course of history the Kiev State was dismembered into a number of feudal principalities and it was this dismemberment which enabled the Mongolians to conquer Eastern Europe. For centuries the Ukraine was the scene of collisions between Poland, Turkey, and Russia. In 1654 most of the eastern section of the Ukraine was joined once again to Russia.

With the fall of tsarism and the triumph of the October Revolution, the Ukraine, which hitherto had held the status of a colony in the Russian Empire, became an independent republic and a member of the family of Soviet states. During the years of the Civil War the emancipated Ukrainian people, with the aid of the Russian people, repelled the attempts of the Poles and Germans to seize this region.

In origin, culture, and language, the Ukrainian nation is close to its fraternal Russian nation. The poetry of the Ukrainian people, written in their own language, is very rich; their folk songs are of rare beauty. Foremost among their poets and writers is Taras Shevchenko, who revealed the power, the beauty, and the melody of the Ukrainian language. The 125th anniversary of the birth of Shevchenko was celebrated early in 1939 with great rejoicing all over the Soviet Union.

The surface of the republic is a plain with low hills—the Donetz Ridge (1,211 feet above sea level) in the southeast and the Volyno-Podolsk Plateau (1,286 feet) in the west. These hills are connected by the Dnieper crystal line ridge which runs from east to west and is intersected by the River Dnieper, flowing from north to south. At the point where the river cuts through the ridge, rapids formerly hindered navigation. Since 1932 these rapids are covered by the water raised by the Dnieper hydro-electric station.

The climate and soils of the Ukraine are eminently suited to agriculture. Within its borders lies the western end of the black-soil zone of the USSR, which has the maximum supply of warmth and moisture. Droughts occur only in the southeastern part of the Ukraine. In the central part of the republic, in the Kremenchug district, the average temperature for July is 70° F., and for Janu-

ary 21.2° F.; annual precipitations vary from 23.5 inches in the northwest to 14 inches in the southeast. In the north of the Ukraine is the zone of mixed forests and podzol soils (the so-called Polesseye Region); the center is occupied by the black soil forest steppe; farther south lies the black soil steppe which in the extreme south is replaced by brown soils.

The Ukraine possesses resources of the utmost importance for the development of industry as well: its depths contain immense deposits of various minerals, and what is of great importance, the raw materials for the metallurgical industry lie close to each other (the coal of Donbas, the iron ore of Krivoi Rog, the manganese of Nikopol, and the limestones of the Donbas). In addition to these minerals, there is rock salt and mercury. Not long ago oil was discovered in the Ukraine for the first time near the town of Romni, in the Soumi Region.

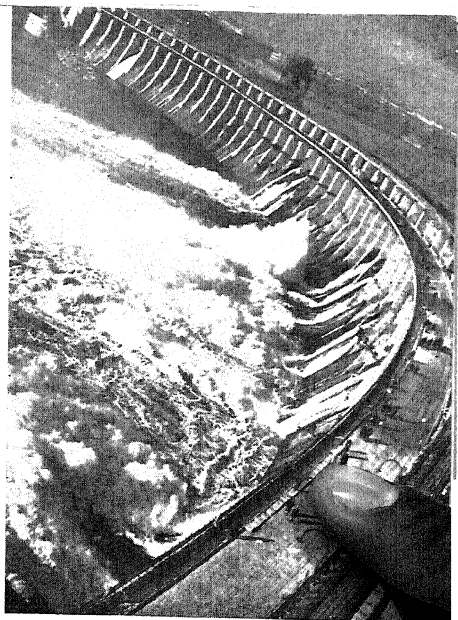
The Ukraine had possessed an industry before the Revolution, but its structure was of an incomplete, colonial character; principally raw material—coal and iron—was obtained and the bulk of it belonged to foreign capital (mainly French, Belgian, and English). Machine-construction and chemistry were only slightly developed. This condition of Ukrainian industry was also to be explained by its newness—railways, for example, appeared in the Ukraine only in the seventies of the 19th century. In addition to enterprises of the coal and metallurgical industries, there were factories of the food industry working up the produce of agriculture (sugar-refineries, flour mills, etc.).

During the years of Soviet rule the mining industry was reconstructed and the Ukraine increased in power and became the first coal and metallurgical base of the USSR.* The output of coal and pig-iron trebled between 1913 when the output of coal was 22,800,000 metric tons, and 1937 when it was 67,100,000 tons. The factories of the Ukrainian SSR produce as much steel annually as Japan, Italy, and Poland taken together.

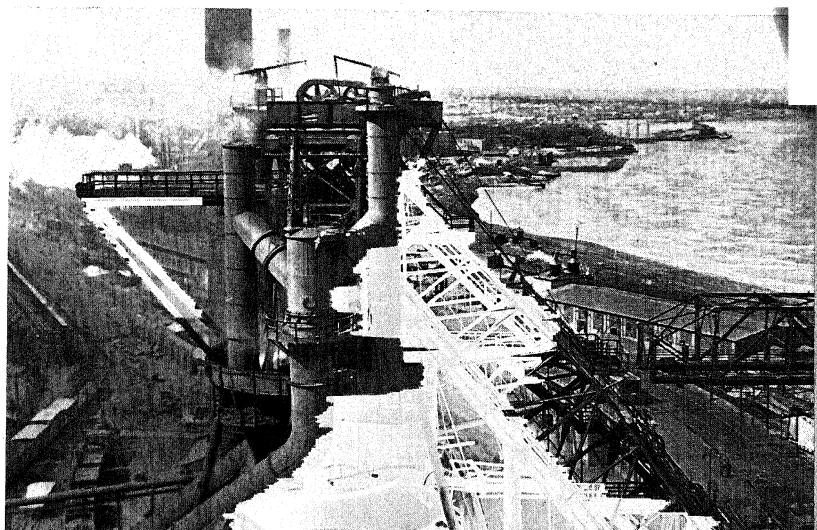
At the same time a change took place in the structure of industry.

*The first coal and metallurgical base of the USSR lies mainly in the Ukraine, but it also includes the Kerch metallurgical district in the Crimea and the eastern end of the Donbas, which lie within the borders of the RSFSR.

The Dnieper Dam



Metallurgical Plant at Kiev, capital of the Ukrainian SSR



Manufacturing industries arose on the basis of the mineral raw material; to metallurgy and coal-mining, the "first story" of industry, was added a "top story" in the form of a highly developed engineering industry, chemical industry, and electric power production (within the period 1913-1937 the output of the engineering industry increased thirtyfold while its proportion in respect to heavy industry as a whole rose from 4% to 25%). Today the heavy industry of the Ukraine includes the extraction of coal, iron ore, manganese, and salt, the manufacture of iron and steel, non-ferrous metallurgy, the chemical industry, machine-construction, and the production of electric power. All these branches are most closely linked, and connected with each other. The light and food industries have also been reconstructed and developed, several branches having been newly created (as, for example, the knitted goods, clothing, and canning industries). The total output of large-scale industry in the Ukraine in 1937 was over seven times the output in 1913.

The heavy industry of the Ukraine is concentrated in two large districts—the Donbas and Dnieper Regions. The largest of the industrial cities (lying outside these districts which are engaged mainly in machine-construction) are Kiev, Kharkov, Odessa, and Nikolayev. (See Map 21, page 218.)

Agriculture in the Soviet Ukraine is highly developed and almost all of its rich fields are under cultivation. Rye, buckwheat, potatoes, and fodder grasses, the last serving as the basis for cattle-raising, are grown in the north, in the Polesye Region.

In the forest-steppe region a broad belt of sugar-beet plantations stretches right across the Ukraine from west-southwest to east-northeast; the produce of these plantations serves as the raw material for a well-developed sugar industry. The waste products obtained after the manufacture of the beet into sugar are used as fodder for cattle.

The vast expanses of the steppe zone are sown with wheat and barley; in the west maize is more extensively cultivated, while in the east, which is a somewhat droughty region, sunflower seed is the principal crop. Within recent years unirrigated cotton plantations (occupying in 1937 an area of 553,280 acres) have sprung up

in the southern part of the steppe zone in the proximity of the coast of the Black Sea.

The Ukraine was one of the first republics of the Soviet Union to begin collectivization and the technical re-equipment of agriculture. The first machine-tractor stations were introduced here. Over 96% of all peasant households in the Ukraine have united in collective farms, and 90,000 tractors and 29,000 harvester combines now operate in the fields. The area under crop has increased from 56,585,900 acres in 1913 to 62,022,100 acres in 1937, the greatest increase being in the land under industrial crops. The increase in harvests is illustrated by the sugar beet crop which in 1932 had an average yield of 3,205 lbs. per acre and by 1937 had increased to 15,755 lbs., with some collective farms having record yields of more than 88,000 lbs. per acre.

During the years 1934 to 1938, the number of cattle in the Ukraine doubled, the number of sheep more than doubled, and the number of pigs almost trebled. Increased production has meant higher incomes, and within this same four-year period, the incomes of Ukrainian collective farms increased by 250%.

Transport is growing. More freight arrives today at the stations of the Ukrainian SSR than at the stations of the whole of Russia before the October Revolution.

This is one of the most culturally advanced republics of the Soviet Union. Within the period of the First and Second Five Year Plans, the number of secondary schools in the Ukraine increased 9.7 times. From 1913 to 1937, the number of universities and colleges increased from 19 to 117; of newspapers from 168 to 1,830 (including 1,402 in the Ukrainian language which had only had one before the Revolution). In 1927 the sum of 141,000,000 rubles was assigned to elementary schools, technical schools, and universities, while in 1938 2,830 million rubles were assigned to the same use. The Ukrainian Academy of Sciences and about 300 scientific-research institutes have been created. Ukrainian literature has developed. Before the Revolution there was not one Ukrainian State theatre. Now there are fifty-three, not including thirty-two Russian, Jewish, and other theatres.

The national economy of the Ukraine had been devastated by the

Civil War and intervention (1918-1921). The area under crop was reduced 33%, the extraction of coal 80%, the output of pig-iron nearly 99%, and so on. The Civil War spread all over the territory of the Ukraine. Towns and districts passed from hand to hand many times; for example, there were more than ten governments in Kiev before the Soviet Government established itself there firmly and permanently. The development of the economy and culture of the Ukraine began only after the revolutionary armies and the people had driven the armies of the counter-revolutionaries and German and Polish interventionists from the land.

* * *

Let us take two cross sections of the Ukraine—along the railway crossing the Donetz Coal Basin, and along the River Dnieper.

The train leaves Moscow late at night and passes Kursk at mid-day. Beyond Kursk one feels the approach of the Ukraine. The air is warmer, the forests are thinner, the small wooden houses are replaced by white clay-walled cottages, there are more windmills, and more gardens. Poplars rise above the villages. The roads gleam with the rich black soil. Ox-drawn carts are seen among the motor lorries.

There is no sharp boundary line between the RSFSR and the Ukrainian SSR. One can tell that the train is passing through the Ukraine primarily by the Ukrainian names of the stations. Five hours after leaving Kursk the train arrives in Kharkov.

Until 1934 Kharkov was the capital of the Soviet Ukraine, a large and highly advanced city, of paramount industrial importance in the Ukraine. In it is concentrated nearly half the engineering industry of the Ukraine: its enterprises produce tractors, turbo-generators, machine lathes, locomotives, bicycles, etc.

Looking at the city from a great distance, while one is yet in the steppe, one can see the grey-faceted blocks of new many storied buildings—the Government House, the House of Industry and others—towering above Kharkov.

A direct railway line, about 124 miles long, connects Kharkov with the Donbas via Krasny Liman. It is the principal means of communication between the Donbas and the North; and carries the

greatest freight traffic in the USSR (number of metric tons per mile); it should be borne in mind that the average freight traffic of the Soviet railways is higher than anywhere else in the world. A mighty unbroken flow of coal, as well as of metal and chemical products, runs from the Donbas to the north. New powerful locomotives named for Felix Dzerzhinsky, a Bolshevik leader closely associated with Lenin, draw freight trains at a speed which, with the development within late years of the Stakhanov movement on the railways, exceeds the former speed of freight by nearly fifty per cent.

The Donetz Coal Basin starts beyond Krasny Liman. This is the Soviet Pennsylvania. In the USSR the Donbas is called the "All-Union Stoke-Hole."

The Donbas has a greater network of railways than any other district in the Soviet Union. The train passes one large junction after another, and industrial scenes lie on either side of the continuously busy lines. Everywhere one can see the hoisting towers at the pitheads; the *terricones*, enormous black cone-shaped mounds of excavated debris piled high above the mines. Blast furnaces with Cowper batteries stand in long rows. The glass-walled blocks of machine-building and chemical works, their high chimneys forming an aerial paling, appear one after the other. Heavy clouds of smoke overhang the horizon. The numerous towns are connected by high voltage transmission lines and motor roads.

The Donbas lies in the southeast of the Ukrainian SSR, 60 to 100 miles to the north of the Sea of Azov in the region of the Donetz ridge, which is a gently rolling plateau stretching from west to east along the right bank of the North Donetz, a tributary of the Don. The watershed tracts of the Donetz Ridge resemble a steppe and are thoroughly tilled, and wheat is often to be seen growing in places where coal is being mined underneath the fields. The Donetz Ridge is rich in coal of many varieties: in the northwest, mainly coals containing a large amount of volatile substances and therefore suitable for the chemical industry; coke-forming coals predominate in the center of the region; and in the eastern end—which is partly in the Rostov Region of the RSFSR—the famous huge deposits of high quality anthracites. The Donbas is over 9,900

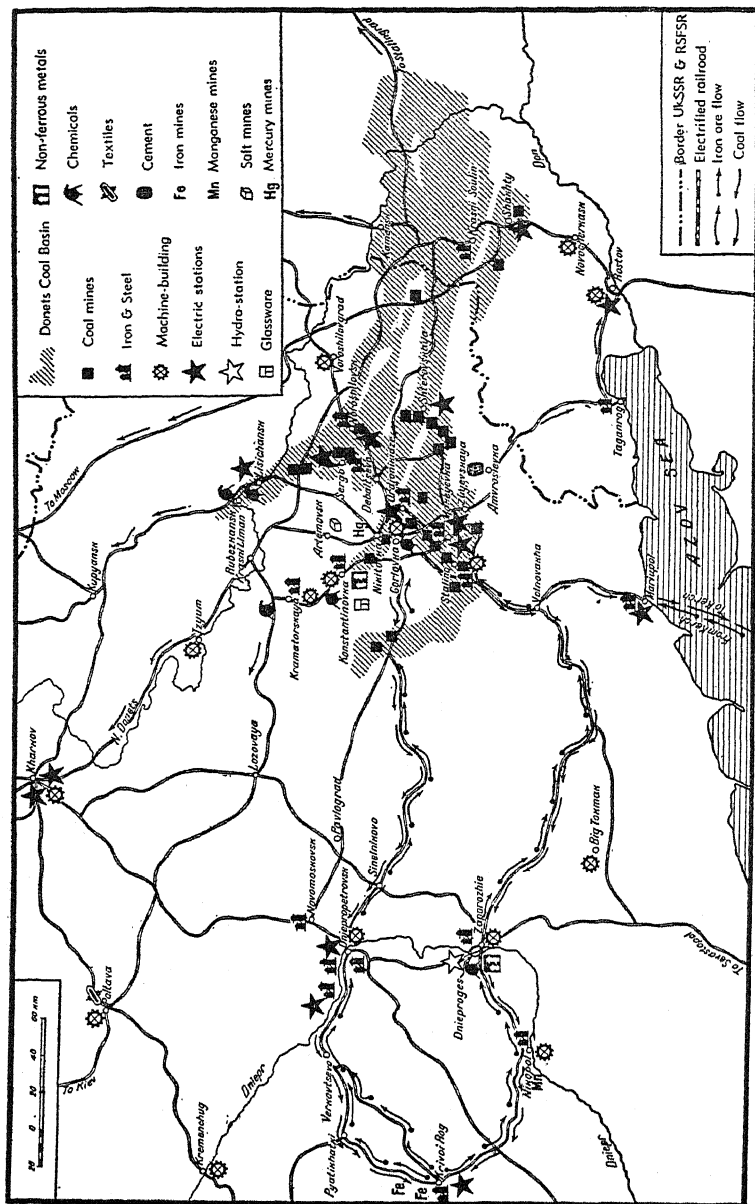
square miles in area. The coal basin was considered to be fairly well prospected, but the explorations of Soviet geologists augmented its ascertained deposits from 55,000 million to 89,000 million metric tons. At the same time the boundaries of the coal basin are being greatly extended; in the east, for example, the boundary-lines of the "Great Donbas" have reached the River Don and are stretching towards the Volga. There is every reason to believe that the figure of the estimated coal deposits of the Donbas will be still further increased.

In coal output the Donbas of today is equivalent to three times the Donbas of before the Revolution. The pits of the old Donbas were shallow and the degree of mechanization was negligible. There are now many deep mines and the miner's labor has been mechanized. Before the War, about 800 engineers and technical experts were engaged in the whole of the coal-mining industry of the Donbas. Today this industry employs about 17,000 engineers and technicians. The coal obtained in the Donbas feeds not only its own industry and the entire industry of the Ukraine, but also that of a large part of the RSFSR including the Volga, Moscow and even Leningrad.

Underground stations of coal-gasification are operating in Gorlovka, and others are under construction in Lissichansk and Kourakhovka. At these new gasification stations, labor productivity will be from five to ten times as great as in the ordinary mines.

In addition to coal, the Donbas possesses a number of other valuable minerals: a large quantity of common salt is extracted in the north; there is rock salt in Artemovsk (formerly Bakhmut) and there are salt solutions in Slaviansk. In the center of the Donbas (in Nikitovka) exploitation of the most important mercury deposits in the Soviet Union is proceeding; the iron and steel industry is well supplied with limestone and dolomites; there is sand for the glass industry; and non-ferrous metals have been discovered.

A considerable part of the iron and steel manufactures of the Ukraine are situated in the Donbas. They work on the iron ores of Krivoi Rog, which lies 280 miles to the west, on the other side of the Dnieper. The iron and steel industry of the Donbas, as of the whole of the Ukraine, has undergone a radical transformation.



Although no new metallurgical works have been constructed there, the old ones have been so much improved and enlarged, they could be called new works. Side by side with the small blast furnaces of former days, there tower new gigantic blast furnaces, with a capacity of 35,000 to 46,000 cubic feet. Pre-revolutionary Ukraine knew no such industrial giants.

Among the metallurgical works of the Donbas there is the colossal plant in Makeyevka, which in 1936 produced 1,300,000 metric tons of pig-iron—nearly a third of the output of the whole of Russia before the war. At present, this plant alone produces twice as much pig-iron as all works in Poland taken together. In addition, there are iron and steel works in the following towns of the Donbas: Stalino (formerly Youzovka), Orjonikidze (formerly Yenakievo), Konstantinovka, Kramatorsk, Voroshilovsk (formerly Alchevsk), and others.

Before the war coke gases were not utilized at all. Now an important chemical industry has arisen in the Donbas based on the by-products of coking and metallurgy. Of great importance as well is the sodium industry which has sprung up on the salt deposits of the north of the Donbas.

A large-scale machine-building industry has come into being in the Donbas during the years of the Five Year Plans. In Kramatorsk, a plant producing metallurgical equipment has been constructed, one of the biggest of its kind in the world and equipped with the best machinery. The annual output of the plant is sufficient to equip fully several up-to-date metallurgical works. Machinery for the mining industry, drills in particular, is manufactured in Gorlovka. Powerful locomotives are made in Voroshilovgrad (formerly Lugansk), where a great new locomotive-building plant has taken the place of the old works; here, before the Revolution, one of the mechanics was Marshal Voroshilov, People's Commissar for Defense.

The Donbas also produces zinc, fire-proof materials, brick, and glass. The electric-power stations work on coal-dust and are all connected to form the great Donetz power grid. An oil pipe-line has been laid from Grozny in the North Caucasus to the Donbas.

Great changes have taken place during the Soviet years in the

communal economy of the Donbas. The shanties and mud huts, in which most of the workers used to live, have been replaced by houses, and the towns have consequently grown on a large scale. For example, to the 2,825,000 cubic feet of housing which existed in Stalino before the Revolution, 35,310,000 cubic feet were added in the Soviet years. Before the Revolution this town had three elementary schools, and now it has 110 elementary and secondary schools and three universities. Clubs and theatres have been built. Street cars and buses are running. There had been no vegetation at all in the industrial Donbas before the Revolution; now the towns have been provided with plants and flowers, gardens have been laid out, and parks "of culture and rest" created. With the growth of industry the number of cities in the Donbas has increased from 15 in 1933 to 52 in 1938, and that of villages of town type from eight to 167.

Several railway lines run from the Donbas. One of these leads to Mariupol, a large seaport town on the coast of the Sea of Azov, to the south of the Donbas. A few years ago a large metallurgical plant, known as "Azovstal," was erected here. With the aid of Donetsk coke it works up the iron ore of Kerch, which lies in the eastern part of the Crimean Peninsula. A large mechanized mine, the Kamish-Bourun mine, has been constructed in Kerch, from which ore is brought to Mariupol by sea. Mariupol is the seaport for the Donbas, which exports part of its coal and pig-iron. But besides the industrial Donbas, the hinterland includes the vast agricultural steppe of Eastern Ukraine, which exports grain via Mariupol.

The Ukrainian steppe is a boundless expanse sown with wheat, barley, and other marketable crops. Agricultural labor has been mechanized to a very high degree, and may well be called a form of industrial labor. Collective work based on the collective ownership of the means of production brings in high incomes to the collective farmers. There are many first-rate collective farms here, celebrated far beyond the borders of the Ukraine, which are visited for the purpose of study and the exchange of experience by collective farmers from different regions of the Soviet Union.

Here, for example, is the "Stalin" collective farm situated in

the Genichesk district. In the droughty summer of 1938 it obtained a yield of 1408 pounds of grain per acre. The stock of the collective farm includes thousands of fine-fleeced sheep, hundreds of cows yielding large quantities of milk, and hundreds of pedigreed pigs. Cattle breeding alone brought an income of 1,376,000 rubles in 1938, and the total income in cash of that collective farm in the same year was 4,000,000 rubles, putting it in the group of millionaire collective farms. The farm operates a radio transmitting station and an electric power plant. It has a well-equipped club and a library containing 5,000 volumes. The farmers subscribe to books, newspapers, and magazines to the value of 21,000 rubles a year. Many families have built new homes.

* * *

From north to south the Soviet Ukraine is crossed by the Dnieper, which juts out towards the east when it reaches the center of the republic.

The Dnieper is the third longest river of Europe (1,329 miles) after the Volga and the Danube. It has its source outside the Ukraine, in the district of the Valdai (in the Smolensk Region), and before entering the Ukrainian SSR, passes through the Byelorussian SSR. The importance of the Dnieper for the west of the European part of the USSR is the same as that of the Volga for the east of the European part of the USSR.

The Dnieper was the main section of the ancient river route "from the Varangians to the Greeks" whose busy trade connected the Scandinavian countries with Byzantium a thousand years ago. The route lay from the Gulf of Finland in the Baltic Sea along the Neva, Lake Ladoga, the river Volkhov, Lake Ilmen, the Lovat River, and then partly along small rivers, partly by portage, to the upper reaches of the Dnieper, and along the Dnieper to the Black Sea. The route had a branch towards the West Dvina, which falls into the Gulf of Riga in the Baltic Sea.

Today the idea of a through route along the Dnieper from the Ukraine to the north of the USSR is materializing in connection with the problem of the "Great Dnieper," *i.e.* the problem of the complex reconstruction of this river. The plan provides for the

erection on the Dnieper of a number of hydro-electric stations which will produce energy and deepen the river; hydro-technical constructions will subsequently connect the upper reaches of the Dnieper with the West Dvina and the basin of Lake Ilmen, which is connected with Leningrad through the rivers Volkhov and Neva. The waters of the Dnieper are to be used to irrigate the steppes of south-east Ukraine and North Crimea. The reconstruction of the Dnieper has begun with the erection of the "Dnieproges" hydro-electric station in Zaporozhye, which is situated at the point where the Dnieper crosses the Dnieper Ridge. Some of the more important hydro-stations on the Dnieper are shown on map 3 (page 12). This map also shows the proposed exit of the Dnieper in the northern direction.

The Dnieper enters the Ukraine at its junction with the Pripet, from the right. Polessye is situated here, a district near the town of Chernigov, and at this point the Ukraine enters the zone of mixed forests and podzol soils. Soon the forests become thinner and the Dnieper, into which the Diessna flows from the left, passes into the zone of forest-steppe. On the threshold of the forest-steppe stands the capital of the Soviet Ukraine—Kiev ($50^{\circ} 21' N.$, $30^{\circ} 30' E.$), one of the oldest, most highly cultured, and beautiful towns of the USSR. In population (about 800,000) Kiev is one of the most important Soviet cities.

Kiev, whose rise was favored by its situation on the great water route of Eastern Europe, flourished in the 11th-12th centuries as the capital of Kiev Russ. There are many historical monuments here, among them the famous Cathedral of St. Sophia and the ruins of the Golden Gates of the 11th century.

The town stands on the hills of the right bank of the Dnieper, high above the spring-inundated meadows of the left bank, which are enclosed by a distant wall of pine forests. The hillsides between the houses are covered with cultivated gardens. The banks of the Dnieper are faced with granite. The town with its many handsome buildings and its sidewalks lined with chestnut trees, has the character of a first-class European city. It is favored by a mild, healthy climate.

Since the transference of the Government of the Ukrainian SSR

to Kiev from Kharkov in 1934, the city has been reconstructed, its services further improved, and its housing program extended. Before the Revolution Kiev was for the most part a town of merchants and officials, with scarcely any enterprises other than those of food and light industries (confectionery, footwear, and others). While continuing to occupy first place in the Ukraine as regards light industry, Kiev has now become an important center of heavy industry, producing automatic lathes, equipment for the chemical, sugar, leather, and other branches of industry, river vessels, etc. Outstanding among the numerous cultural institutions of Kiev are the Ukrainian Academy of Sciences, a number of scientific-research institutes (geological, water transport, bibliography, etc.) and the Museum Town situated in the former Kiev-Pecher Monastery (founded in the 11th century).

After leaving Kiev the Dnieper turns to the southeast. The broad river (2000 to 5000 feet) moves calmly and slowly, forming islands and side-channels. The hills of the right bank are concealed in green gardens.

The Dnieper divides the Ukrainian forest steppe here into the Left Bank Region and the more elevated and humid Right Bank Region. This is a zone of beet plantations and frequent sugar refineries, particularly numerous in the Right Bank Region. The chief towns of the Right Bank Region are Vinnitsa, Zhitomir, Shepetovka, Berdichev, Kamenetz-Podolsk, Cherkassi, Belaya Tserkov, and Uman. The chief towns of the Left Bank Region are Poltava and Soumi.

Passing the town of Kremenchug, where the construction of a Dnieper hydroelectric station is planned, the Dnieper enters the steppe zone, which is mainly sown with wheat, and soon passes into an industrial region known as the Dnieper District (Pridnieprovie). First there appears the large metallurgical works of Dnieprodzerzhinsk (formerly Kamenskoye) on the right bank, and then a group of large metallurgical and metal-working plants of Dniepropetrovsk (on the right bank) and of Nizhnednieprovsk (on the left bank, just opposite).

Dniepropetrovsk (formerly Yekaterinoslav) is one of the largest cities of the Ukraine, noted for its fifteen colleges and universities.

Lying on the route between the iron ores of Krivoi Rog and the coal of Donbas, the iron and steel industry and metal-working have developed as a consequence of the advantageous position of the town.

The steamer sails in a southerly direction, after leaving Dniepropetrovsk, between changed banks. The level of the water here has been raised by the Dnieproges dam. Formerly the river, rushing through the granite and gneiss of the Dnieper Ridge, formed ten rapids, which, from the point of view of navigation, divided the Dnieper into two isolated sections. Only the most highly skilled pilots were able to descend these rapids; they used to take tourists through them in special shallow boats ("dubs") picking their way through the seething waves.

A plan for the utilization of the rapids of the Dnieper for the generation of electricity was thought of even before the Revolution, but the inundation of the banks meant at the same time the inundation of the land lying along the banks, and the influential great landowners therefore prevented its realization. Large sums of money were required, that were not forthcoming. There were no really large consumers of electric power in the Dnieper district.

The abolition of private ownership of the land and the possibility of developing simultaneously and in accordance with a plan both the production and the consumption of electricity, provided the basis for the construction of the largest hydroelectric station in Europe: the Lenin Dnieper Station ("Dnieproges") with a capacity of 558,000 kilowatts. It was erected in 1932 according to the plan of Alexandrov, member of the Academy of Sciences of the USSR and with the aid of American engineering technique in the person of Col. Hugh Cooper.

The bed of the river is spanned by a ribbed concrete dam, slightly convex on the side facing the current. The length of the dam is 2,500 feet, its height about 200 feet and the level of the water is raised 125 feet. The water has been raised the whole length of the river up to the town of Dniepropetrovsk (a distance of about sixty miles up the river from the dam), all the rapids have been covered by the raised water and a huge reservoir has been formed. A trolley line has been laid along the dam.

A turbine building, faced with pink tufa, has been erected on the right bank of the Dnieper. Nine turbines, each with a capacity of 62,000 kilowatts, stand in a spacious glass-walled hall. This row of machines recapitulates the progress of the technical and economic independence of the USSR. Brass plates bearing the trade marks of their manufacturers are affixed to these turbines: the first bear the inscription "General Electric Co., U.S.A." and the others "Electrosila, Leningrad."

The Dnieper hydro-electric station generates more electric power than did the whole of pre-revolutionary Russia. The electricity is very cheap—approximately 0.5 kopecks per kw-t-hour. A defect of the station is the somewhat seasonal character of its work, due to the unevenness of the flow of the Dnieper. This, however, is a temporary defect to be rectified by the construction of the other hydro-electric stations higher up on the Dnieper, which will regulate the flow of the river and make it more even.

Dnieproges electricity is transmitted along high tension wires to Krivoi Rog and Dnipropetrovsk. The thermal electric power stations feed the same system. The next task is to connect this electric system with the system of the electric power stations of the Donbas. Part of the energy of Dnieproges is used by the surrounding collective farms, which have organized electric plowing and electric milking. But the bulk of the electricity of the Dnieper is used by the Dnieper Industrial Combine.

The enterprises of this huge combine have been erected in the steppe on the shores of the new lake created by the dam of the hydro-electric station. They comprise a whole town of factories always wreathed in smoke, emitting sparks and flashes when its coke-furnaces are being stoked up and its pig-iron is smelted, giving out the characteristic, resounding metallic scrunching noise of metallurgical works. The Dnieper Combine includes a number of enterprises which in themselves are combines: a metallurgical combinat producing pig-iron, high-grade electric steel, and rolled iron (the first slabbing mill in Europe was set up here); an aluminum combine composed of electrolyte, alumina, and electrode works; a coke-chemical combine; a ferrous alloy works (ferro-manganese, ferro-silicon, ferro-chromium, etc.); a magnesium works; a plan utilizing

metallurgical scrap for the manufacture of building materials; and a mechanical repairs plant.

All the enterprises of the Dnieprovsk Combinat are in very close technological connection with each other, making possible the maximum utilization of raw material without expense on transport of by-products and semi-manufactured products. The industrial process is therefore accomplished without waste. For capacity, comprehensiveness, and technical perfection the Dnieper Combinat has no equal. It reveals to the full the advantages of coordinated enterprises under socialist planned economy.

Side by side with the hydro-electric station and the Industrial Combine the new town of Zaporozhye stands on the left bank of the Dnieper. In addition to the industries already spoken of the Zaporozhye District (including the former town of Alexandrovsk, which forms part of the new town) produces harvester combines on a large scale. The railway line connecting Zaporozhye with Krivoi Rog is electrified.

The Dnieproges dam covered the rapids with water, and transformed the Dnieper into a through navigable waterway, connecting the upper reaches of the river with the Black Sea. The steamer descends through a three-chamber sluice to the lower reach, passes under a new high vaulted bridge, and sails in a southwesterly direction along a fairway among islands celebrated as the site, in the 16th-18th centuries of the famous military organization of the Ukrainian Cossacks—the “Zaporozhye Sech.”

Below Zaporozhye the Dnieper flows through a broad grassland tract. This is the “Dnieper Plavni” district which is flooded in spring; during the Soviet years extensive rice plantations were created here, the first to appear in the Ukraine.

On the right side of the Dnieper stands the town of Nikopol, well-known for its great manganese deposits. The crude ore contains up to 33% manganese; after enrichment, up to 57.6%. The exploitation of these deposits is proceeding; part of the ore is exported. During the Second Five Year Plan period an important tube-making industry was created in Nikopol.

Just over 60 miles to the west of Nikopol and away from the Dnieper, lies Krivoi Rog, the most important iron-ore region of the

USSR, producing more iron ore alone than all the others taken together. In addition to over 1,000 million metric tons of pure and rich ores (with a content of 58-62%) which are being mined, there are huge quantities (over 10,000 million metric tons), of less rich iron quartzites. Not long ago a large metallurgical works with blast furnaces 45,900 cu. ft. in volume was erected in Krivoi Rog; since the erection of this works part of the empty trucks returning from the Donbas, after having carried Krivoi Rog ore there, are now loaded with coal. The largest Bessemer plant in Europe is reaching completion. A plant is under construction for the direct production of iron from iron ore.

Not far from Krivoi Rog lies the town of Kirovograd (formerly Yelizavetgrad) with its agricultural machinery construction and lignite-extraction, which is of importance as local fuel for part of the Right Bank Region of the Ukraine.

To the west of Krivoi Rog, along the frontier river Dniester, lies the Moldavian Autonomous Soviet Socialist Republic (3,250 sq. mi.), which forms part of the Ukrainian SSR. This is a black-soil steppe region abounding in ravines and ditches, engaged in maize and wheat cultivation, horticulture and viticulture, food canning and wine-making. The capital of Soviet Moldavia is Tiraspol. In addition to the Moldavians, who have given their name to the republic, it is inhabited by a large number of Ukrainians.

To the south of Nikopol the Dnieper flows between flat banks. The flatness of the steppes is only broken here and there by low tumuli (ancient burial mounds) overgrown with feather-grass.

East of the Dnieper lies the Preserve of Askania-Nova (123,500 acres), consisting of an untilled virgin steppe, a botanical garden, ponds, farms with land attached, and a zoological garden in which bisons, zebras, ostriches, and other foreign animals are kept. An experimental and biological institute, unique in Europe in its field and in the character of its experimentation has been created in Askania-Nova. Its work is directed towards the improvement of breeds of domestic cattle, the acclimatization and domestication of wild animals, the problem of artificial fecundation. For example, Far Eastern spotted deer, whose young horns provide a valuable medicine, have been acclimatized in the Ukraine. New breeds of

sheep and pigs have been supplied to collective farms. Auroch (bisons) which now resemble the extinct pure bison, have been obtained by cross-breeding.

The principle of the organization of Soviet preserves can be seen from the example of Askania-Nova. In the USSR the principle of not interfering with nature is rejected, for it is considered that human effort is a powerful force in the changing aspect of the globe; not passive defense, but the active alteration of nature; not only observation, but experimentation. The preserves are not only storehouses of valuable plants and animals, not only places of recreation and enlightenment, but also scientific institutions solving industrial problems.

On the lower reaches of the Dnieper unirrigated cotton covers an extensive area. The sandy terraces on the banks are partly covered by vineyards.

Near the town of Kherson the Dnieper falls into the Dnieper-Boug estuary—a gulf of the Black Sea. On the banks of this estuary, at the point where the Southern Boug falls into it, lies the town of Nikolayev, the most important shipbuilding center on the Black Sea.

On the coast of the Black Sea, to the west of the mouth of the Dnieper, stands the town of Odessa, possessing a highly varied industry: food, chemical, footwear, jute and hemp, engineering, ship-repairing, and other plants. For a long time Odessa was the most important grain-exporting port of old Russia and, coming into contact with Western Europe, was strongly influenced by it culturally. The town has many health resorts in its vicinity.

In population it is the third city of the Ukraine—after Kiev and Kharkov. It is mixed, with Ukrainians, Jews, and Russians predominating. True southerners, the inhabitants are vivacious and sparkling, a particularly large number of whom have become prominent writers, poets, and musicians.

The Byelorussian Soviet Socialist Republic

THE Byelorussian Soviet Socialist Republic (about 6,000,000 population and 48,960 square miles) lies on the western frontier of the Soviet Union to the north of the Ukrainian SSR and borders upon Poland and Latvia. It is divided into the Minsk, Vitebsk, Gomel, Mogilev and Polesian Regions.

The main part of the population of the Republic consists of Byelorussians, a people who never had their own State organization until after the Great Socialist Revolution in 1917. In addition to Byelorussians the population of the Republic includes Russians, Jews and other nationalities.

The plains of Byelorussia, somewhat hilly and covered with mixed forests, are intersected by the rivers Dnieper (flowing southwards to the Black Sea) and Western Dvina (flowing in a north-westly direction to the Baltic Sea). Here also is the source of the Nemen River.

The nearer to the Atlantic Ocean, the milder the climate, and so, as compared with the center of the European part of the USSR, the winter is warmer and the summer cooler. There is a great deal of atmospheric precipitation (27.3 to 21.4 inches), which, owing to little evaporation, leads to the formation of marshes rich in peat. The soils are podzol. In the capital of the Republic, in Minsk (53° 54' N., 27° 33' E.) the average temperature in July is 63.5° F. (in Moscow 65.6° F.) and in January 19.7° F. (in Moscow 13.6° F.).

Agriculture in Soviet Byelorussia specializes in industrial crops: flax (in the north), hemp (in the south) and chiefly potatoes (in the central part of the Republic), which also provides a base for

pig-breeding. Industry works up local raw materials obtained from plants and animals (woodworking, cellulose, paper-making, bristles, leather and footwear, meat, flax, hemp and other branches of industry) and also mineral raw materials (production of glass, cement and phosphate fertilizer). With raw material brought from outside, a machine construction industry has been established which chiefly provides for the needs of the local economy (production of agricultural and other machines), and a clothing industry which employs the labor of former handicraft workers and artisans. Electric power stations work on peat, which is also used as a fertilizer and as a raw material for the chemical industry.

Pre-revolutionary Byelorussia was an agrarian colony of the Russian Empire. Its backward agriculture supplied about 75% of the production of its national economy, and 70% of its industry consisted of handicrafts. A tenth of the peasantry did not possess any land. The Jewish artisans living in the small over-populated "*mes-tekhs*" (from the Polish word "*miasteczko*," meaning a small town) were unable to find employment. Before the War the Byelorussian and Jewish poor emigrated to the United States in thousands.

During the years of German and Polish occupation, Byelorussia was ruined; in 1920 sowings declined by 40% and industrial production by as much as 85%. During Soviet years, and chiefly during the two Five Year Plans, the Byelorussian SSR has been transformed into a rich country with a highly organized industry and agriculture. Here are figures showing the progress of Byelorussia in Soviet times: Industrial production in Byelorussia increased from 89 million rubles in 1913 to 2,100 million rubles in 1937—a twenty-fourfold growth. Industry in this republic grew more rapidly than the average growth in the USSR as a whole.

In 1913 the output of industry constituted only a quarter of the production of the entire national economy of Byelorussia; in 1937 it constituted three-quarters, while their agricultural production continued to grow in the same period.

In 1937, 2,500,000 tons of peat were gathered—16 times more than in 1929. Production of electric power amounted to 421,400,000 kilowatt-hours in 1937—100 times more than in 1913. Wages increased

fourfold during the two Five Year Plans. By the end of the Second Five Year Plan, 96 per cent of the peasant sowing area was collectivized. In 1937, 8,672 tractors were to be seen on the fields of Byelorussia (in 1928 only 123) and 1,236 harvester combines (not a single one in 1928).

The sowing area has almost doubled, while the area under potatoes and flax has trebled. The harvest yield of grain crops has doubled and in the best collective farms it has increased three to five times.

New professions have been created in the rural districts: in the whole of the Republic there are 22,000 tractor operators, about 1,500 combine operators and more than 2,000 machinists operating threshers.

Soviet Byelorussia is a land of complete literacy. Prior to the October Revolution 264,000 children attended school; today the number of children in schools is 1,000,000. Twenty-five higher educational establishments and 14 theatres have been established; and more than 200 newspapers and hundreds of different books are now published in the Byelorussian language, which was prohibited under tsarism.

* * *

From east to west Soviet Byelorussia is intersected by the shortest railway route between the centre of the USSR and Western Europe. Orsha is the first city of the Byelorussian SSR on this railway line from Moscow. An enormous space around the town, situated on the banks of the Upper Dnieper, is built over with the grey, cubic, glass-walled blocks of large new factories. Here meat and flax-weaving industries have been established. To the north, beyond a dense wall-like fir forest is the Osinovsk electric power station, the largest in Byelorussia, erected on a peat bog. Through the cuttings in the forest run high voltage transmission lines carrying electricity from the station to various districts of the Republic.

Beyond Orsha, running through copses and flax fields, the railway crosses the river Berezina, a right tributary of the Dnieper. This is a well known spot in history. It was here, in November 1812, that Napoleon nearly lost the remnants of his army, in his

retreat from Moscow across the river on which the ice had broken. A few miles from the railway bridge traces of the French redoubts are still to be seen.

At the point where the railway crosses the Berezina stands the city of Borisov with a large match industry. To the north, in the upper reaches of the Berezina, is the Byelorussian Preserve where beavers are bred in the forests.

The train arrives at Minsk, capital of Soviet Byelorussia, and the name of the station is written in four languages—Byelorussian, Russian, Jewish and Polish—thus: МЕНСК, МІНСК, מינסק, Mińsk.

Minsk stands at the point where the river Nemig falls into the Svisloch, a tributary of the Berezina. The River Nemig figures in the Russian epic, "Ballad of Igor's Regiment," a poem written almost 1,000 years ago, as the spot where the battle between the detachments of the princes was fought.

Old Minsk was a city of class contrasts, like all Byelorussian towns. Towering over a dirty sea of hovels, over a poverty-stricken ghetto, stood stone buildings in which one felt a breath of the West: the town-hall with its clock-tower, cathedrals with two high steeples and pediments, and statues in the niches.

Soviet Minsk is asphalted and paved with clinker. Streetcars and buses run through the streets. Entire districts of the city have been built up with new houses. Of the newly erected buildings, the impressive Government House, the handsome House of the Red Army, and the big University City are outstanding. The Byelorussian Academy of Sciences, a Conservatory, and a Peat Scientific-Research Institute have been founded. In Minsk, light industry (clothing, footwear and other branches) has been enlarged and transformed on entirely modern lines; in addition, an engineering industry has been established producing peat combines, tool grinders, drill presses and other machines.

Not far from Minsk and at a distance of 496 miles from Moscow, is the frontier station of Negoreloye. Poland lies beyond Negoreloye, and the railway line runs from the Soviet border to Warsaw.

From north to south the Byelorussian SSR is intersected by the railway running from Leningrad to Kiev. In the northern part, where the railway crosses the Western Dvina, lies the city of

Vitebsk. It stands on high hills over the deep bed of the river, and is one of the largest industrial centers of Byelorussia. The city skyline is outlined by numerous factory chimneys. Knitted goods, linen, articles of clothing, needles, and other things are produced in this city on a large scale. It is surrounded by a moraine landscape marked by ridges of glacier hills, numerous lakes, boulders on the fields.

The railway, from Leningrad through Vitebsk, crosses the Moscow-Warsaw line at Orsha and runs further south along the Dnieper. On the bank of the Dnieper stands Mogilev, a rapidly growing town.

The train crosses Byelorussia, between fir-tree forests and arable land. On the meadows flooded by rivers grow aspen trees providing the finest wood for matches. Collective-farm villages and small towns previously called *mestechkos*, dot the landscape.

The Jewish *mestechko* of southwest Russia, in the districts of the Jewish "pale" (the restricted districts in old Russia in which Jews were allowed to reside) was neither town nor village, only a cluster of squalid overcrowded huts around a synagogue and rotten pavements along filthy streets. Almost every fifth person was either a tailor or a cobbler, working in miserable little shops whose entire capital consisted of a few rubles, and living on a diet of bread and herring. It was a terrible and hopeless life, as depicted in Sholom-Aleichem's stories and Chagal's paintings.

Today there is no "problem of the *mestechko*" in the USSR. With the industrialization of the country, the Jewish artisan finds employment for his skillful labor. The newly created large-scale industry of the Byelorussian SSR alone employs as many as 50,000 Jews of the former *mestechkos*. Industry has come not only to the town, but to the *mestechko* itself as well. A sawmill, for example, has been built in Dubrovno and provides employment for all the inhabitants of the hamlet. Artels have been established. Many of the Jews have taken up agriculture. The former *mestechkos* now have electric light. A dense network of roads has been constructed. Jewish theatres of the Republic tour the small towns. All the children attend school and the Jewish language has become purer and richer.

The train passes through the southern part of Byelorussia. Fir

trees gradually disappear. Groves of wide-leaved horn-beam trees come into sight, with nests of storks perched on their branches.

Endless orchards indicate the outskirts of Gomel.

Gomel stands on the Sozh, a tributary of the Dnieper. In the center of the town, on the slope of the hill, a dense park descends to the river. The feel of the south is in the streets: lines of white acacia, poplars, houses with balconies.

During the years of the Five Year Plans, Gomel, together with its suburb Novo-Belitsy, became a large industrial center. An engineering industry producing agricultural machinery (flax-pullers, ditch-diggers and other machines), wood-working and cellulose industries have been created in this town. Glass and paper are also manufactured in the Gomel district.

West of Gomel, in the Mozyr district, lies Byelorussian Polessye. This is an extensive marshy lowland in the basin of the sluggish river Pripet, a right tributary of the Dnieper. Amidst the marshes on the sandy hills grow pine-trees lending a northern aspect to southern Polessye. There are many lakes with muddy shores. In the spring the marshes join and form one vast expanse of water covering the entire countryside. The villages, which are situated on high spots, become islands, and communication between them is carried on by rowboats.

In Soviet Byelorussia, where marshes occupy a considerable part of its territory, extensive drainage work is proceeding. About 1,740,000 acres of marsh land (in the basin of the Oressa, Vedrich, Braginka and other rivers) have been drained. A large part of the area has been drained intensively, i.e. not only the surface but also the deep soil waters have been drained away. The draining work is of a complex nature; it provides not only new arable land and meadows, but also new waterways and new peat pits.

Before the October Revolution practically all of the land that was drained off belonged to the landowners, and the reclaimed tracts were turned into meadows and hay-fields. Today the collective and State farms more and more frequently sow flax, hemp, vegetables, and fodder grasses on them. Crops new to Byelorussia, for example, the rubber plant koksaghiz, are also sown, producing an exceptionally large yield on the drained marshes which are unusu-

ally rich in organic matter. It was previously thought that grain crops grew poorly on drained lands. It has now been established, however, that the introduction of copper ore in marshy soil increases the yield of grain.

The aspect of many marshy districts of Byelorussia has changed. In the past, swampy, desolate jungles, clouds of mosquitoes, pestilent winds of the marsh. Today: firm dry land, healthy air, and new roads and settlements. State farms with tens of thousands of acres of land—the largest agricultural enterprises ever established on drained marshes—have been created.

The Union Republics of the Transcaucasus

THE Caucasus is located on the isthmus which connects Europe and Asia, between the Black and the Caspian Seas.

Extending east and west, from sea to sea, the Main Caucasian Mountain Range divides the North Caucasus, which is part of the Russian Soviet Federated Socialist Republic, from the Transcaucasus which consists of three Soviet Socialist Republics: Azerbaijan to the east; Georgia to the west; and Armenia in the south central part.

Until 1936 these three republics formed the Transcaucasian Soviet Federated Socialist Republic, one of the republics of the Union of Soviet Socialist Republics. Since the adoption of the new Stalin Constitution, each of these three republics—Azerbaijan, Georgia, and Armenia—have become constituent republics of the Union. Common features in the natural conditions, the history, and the economy of these republics make it expedient to preface a detailed consideration of each with a general introduction.

The Soviet Transcaucasus occupies an area of 71,650 sq. mi., which is .87% of the territory of the USSR. In the north the Transcaucasus is bordered by the watershed ridge of the Main Caucasian Range, in the south by the frontier between the USSR and Turkey and Iran, in the west by the Black Sea, in the east by the Caspian Sea.

This comparatively small area includes an amazing variety and wealth of natural and economic forms and modes of life. Snow-capped mountain summits can be discerned through the leaves of the palm. Barren rock alternates with soil abounding in sub-

tropical flora. Waterless sun-parched tracts of land are to be found close to swamp lands. Electric trains cross tracks made by beasts of burden. Important industrial towns have sprung up alongside the tents of collective farm shepherds.

The Transcaucasus is a region of varied and complex contour: from plains lying below sea level to snow-clad peaks attaining an altitude of more than 16,500 feet. As interesting as the diversity of levels in the Transcaucasus is the fact that its territory can be divided into five almost equal regions based on altitude: up to 500 feet; 500 to 2,000 feet; 2,000 to 4,000 feet; 4,000 to 5,900 feet; and over 5,900 feet.

The Main Caucasian Range, over 685 miles long, extends from west northwest to east southeast, each of its ends terminating at the sea. The Caucasian Mountains are like a lofty wall very inaccessible in the central part and with a very steep southern slope. They are crossed by several passes, only one of which (the so-called Georgian Military Road) is adapted for automobile traffic. A large section of the range lies above the snow line: the highest summit of the watershed ridge, Mount Shkhara, is 16,890 feet in height. The highest mountain in the Caucasus (and in Europe) the double-peaked extinct volcano Mount Elbrus (18,468 feet and 18,350 feet), rises to the north of the watershed ridge, within the borders of the RSFSR.

To the south of the Main Caucasian Range, the Little Caucasus includes the northern part of the Armenian volcanic highlands, which comes within the borders of the USSR. This highland district is formed of a system of plateaus (average height 4,950 feet) and mountain ranges with cone-shaped extinct volcanoes towering above them; the highest of these in the USSR is Mount Alaghez (13,435 feet). Mount Ararat (16,916 feet) lies close to the Soviet frontier within the borders of Turkey.

The Main Caucasian Range and the Little Caucasus are connected with each other by the meridian Suram chain, 3,280 to 4,920 feet in height. To the west of this watershed range, between it and the Black Sea and along the river Rion, lies the Rion lowland district (Colchis). To the east of the Suram Chain, by the Caspian Sea, on the lower reaches of the river Kura and its tributary the

Arax, lies the Kura lowland district, part of which is below ocean level.

Earthquakes are not uncommon in the Transcaucasus, violent earthquakes having occurred in Shemakha (Azerbaijan) in 1828, 1859, 1869, 1902 and 1920.

The climate of the Transcaucasus is also varied. The Transcaucasus lies on the borderline between the spheres of influence of the humid Atlantic and the dry uplands of western Asia; in addition, the Transcaucasus is divided up by mountains which not only separate climatic regions, but also create vertical climatic zones as numerous as the levels attained by the mountain slopes. They begin at the top with the polar climate of the snow-capped summits and finish with the climate of the sub-tropics at the bottom.

Two sharp climatic dividing-lines are the Main Caucasian Range, which protects the Transcaucasus from cold northeasterly winds, and the Suram Chain, which arrests the moist winds coming from the Black Sea and divides the Transcaucasus into two sharply contrasting parts: the humid west and the dry east. In the west, in the humid sub-tropics of Colchis, atmospheric precipitations amount to 97.5 in. a year, while in the east, in the dry sub-tropics of the Kura lowlands, with their continental climate, precipitations amount to only 11.7 in., and even less in places.

There is, however, a small region of humid sub-tropics (with a dry summer) in the eastern Transcaucasus as well: this is the narrow Lenkoran lowland district lying to the south of the estuary of the Kura. Precipitation is approximately 46.8 in. along the slope of the Talish Mountains, which face the Caspian Sea.

In vegetation the Caucasus is the richest and most varied region of the USSR—over 6,000 varieties of flowers are to be found here. The vegetation is distributed in the main in accordance with the law of vertical zonality. There are mountain forests (spruce, beech, and others), principally in the western and humid part of the Transcaucasus. Forests are rare in the arid east. Luxuriant vegetation grows in warm humid Colchis, where tertiary forms and evergreens are to be found.

Of the minerals of the Transcaucasus, Baku oil and Chiatura manganese are present in quantities of world importance; they in-

clude also coal, copper, molybdenum, arsenic, tungsten, tufa, barite, and others. The rivers of the Transcaucasus are mighty sources of water power.

The Transcaucasus is a land with a long and dramatic history, a land of century-old cultural strata. Assyrian cuneiform inscriptions mention the Georgians. The land of Urartu spread to the Transcaucasus: this was an Eastern State which came into being a thousand years before our era. The Argonauts of ancient Greek legend sought the Golden Fleece in Colchis. Prometheus, famed in mythology, was bound to a rock in the Caucasian Mountains for having revealed the secret of fire to men. Temples of the 4th and 5th centuries are still to be seen near Erevan. The Gothic and Romanesque styles bear traces of the influence of Armenian architecture. The great Georgian poet, Shot'ha Rust'hveli, creator of the epic poem "The Knight in the Tiger's Skin," who lived under Tamara in the 12th century, heralded the ideas of humanism long before Dante and the other writers of the Renaissance.

For thousands of years the Transcaucasus—the isthmus between Europe and Asia—was the scene of collisions between different peoples. The historical route from north to south passed along the Caspian coast through the Transcaucasus, while the route from east to west passed through the Kura and Rion valleys over the Suram Pass. Here European powers expanding eastward from the Mediterranean met Asiatic powers in westward movement. In their conflict there resulted also a fusion of cultures. Rome and Iran, Byzantium and the Arabs, Turkey and Russia fought for the rich lands of the Transcaucasus. Streams of Central Asiatic peoples poured through the Transcaucasus into Europe. This human torrent left numerous different nationalities in the Transcaucasus. Aided by the natural features of the country, a population composed of different tribes speaking different languages settled in the deep valleys and isolated ravines.

The ethnographic composition of the Transcaucasus is thus exceptionally diverse. It is inhabited by nearly thirty peoples of different origin, speaking different languages, and possessing different cultures. They do not live everywhere in isolated groups; very often the districts inhabited by different nationalities overlap. Of great

significance before the Socialist Revolution was the fact that peoples of different religions—Christians of various denominations and Moslems—lived here side by side.

The principal peoples of the Transcaucasus, according to their numbers, are Georgians, Azerbaijanians (Turkic peoples), and Armenians, together with a fairly large number of Russians. Then come Ossetians, Abkhazians, Ajarians, Greeks, Kurds, Georgian Jews, Caucasian Jews, Tats, and many others. Negroes (the descendants of Negro slaves brought here in the first half of the 19th century by Abkhazian landowners from the slave markets of Turkey and Egypt) are to be found in certain villages in Abkhazia and Sukhumi.

This national overlapping resulted in fierce enmity between the peoples which lasted for many centuries. Each of the conquerors of the Transcaucasus applied the principle "Divide and rule" and set the peoples of the Transcaucasus against one another. The terrible word "reznya" (slaughter) is inseparable from the conception of the "old Transcaucasus." The entire population of whole towns used to be slaughtered; and hundreds of thousands of Armenians and Azerbaijanians perished in mutual hostilities.

This mortal flame of hatred was fanned for the last time seventeen to twenty years ago, during the rule of the Transcaucasian nationalist counter-revolutionary parties (Georgian mensheviks, Armenian Dashnaks, Azerbaijan mussavatists). As a result of the internecine slaughter of that period, from 70-90% of the population perished in some districts of the Transcaucasus. The ruins of ancient Shusha, one of the most highly cultured cities of the Transcaucasian Middle Ages, which was destroyed in 1920, are still to be seen.

The national problem of the Transcaucasus was solved forever by the Soviet power. The principles of Soviet autonomy have been put into practice and have done away with all controversial questions. Those who profited by dissension between the peoples are no more. The Soviet Transcaucasus has forgotten about national antagonism; this most difficult problem has been solved by the Socialist Revolution, on the basis of the teachings of Lenin and Stalin on the national question.

National peace, which followed upon century-long hostility,

meant the development of the cultures of each of the peoples of the Transcaucasus, even of the least numerous of them. Ancient cultures were regenerated, and their greatest works became the possession of all the peoples of the USSR. The 750th anniversary, for example, of the epic poem of the Georgian poet Shot'ha Rust'hveli, which occurred in 1937, was observed with the same widespread interest by the whole Soviet Union as the centenary of the Russian poet Pushkin: both celebrations were nation-wide. In May 1939 the whole Soviet Union celebrated the thousandth anniversary of "David Sassunsky," that remarkable epic poem of the Armenian people.

The less numerous peoples of the Transcaucasus, who were at the same time the most backward, are now developing their own culture; for example, the Kurds and Tats have created their own written language and literature for the first time with the aid of scientific institutions in the center of the USSR.

The national autonomy realized under the protection of the Soviet Government, signified not only cultural development, but economic development as well. The economy of ancient Transcaucasia had no means of developing under the blows of the invaders. No sooner did it show signs of recovering than it was once again swept away by the whirlwind of wars.

At the beginning of the 19th century the Transcaucasus was annexed by Russia. Russian capitalism drew the Transcaucasus into world commodity circulation, wiping away its local characteristics, ruining its ancient handicraft industries, turning it into a market for its manufactures.

The development of capitalism in the Transcaucasus was reflected primarily in the creation of huge regions of mineral extraction—the oil fields of Baku (which supplied half the oil output of the world at the beginning of the 20th century) and the manganese deposits of Chiatura. Nevertheless these centers were isolated spots in an alien environment. Baku was more closely connected with St. Petersburg and London than with the neighboring Azerbaijan, a land of the most backward patriarchal and feudal relations. Apart from a number of unskilled laborers, everything else was brought to Baku—money, pipes, and lime and all the oil was exported.

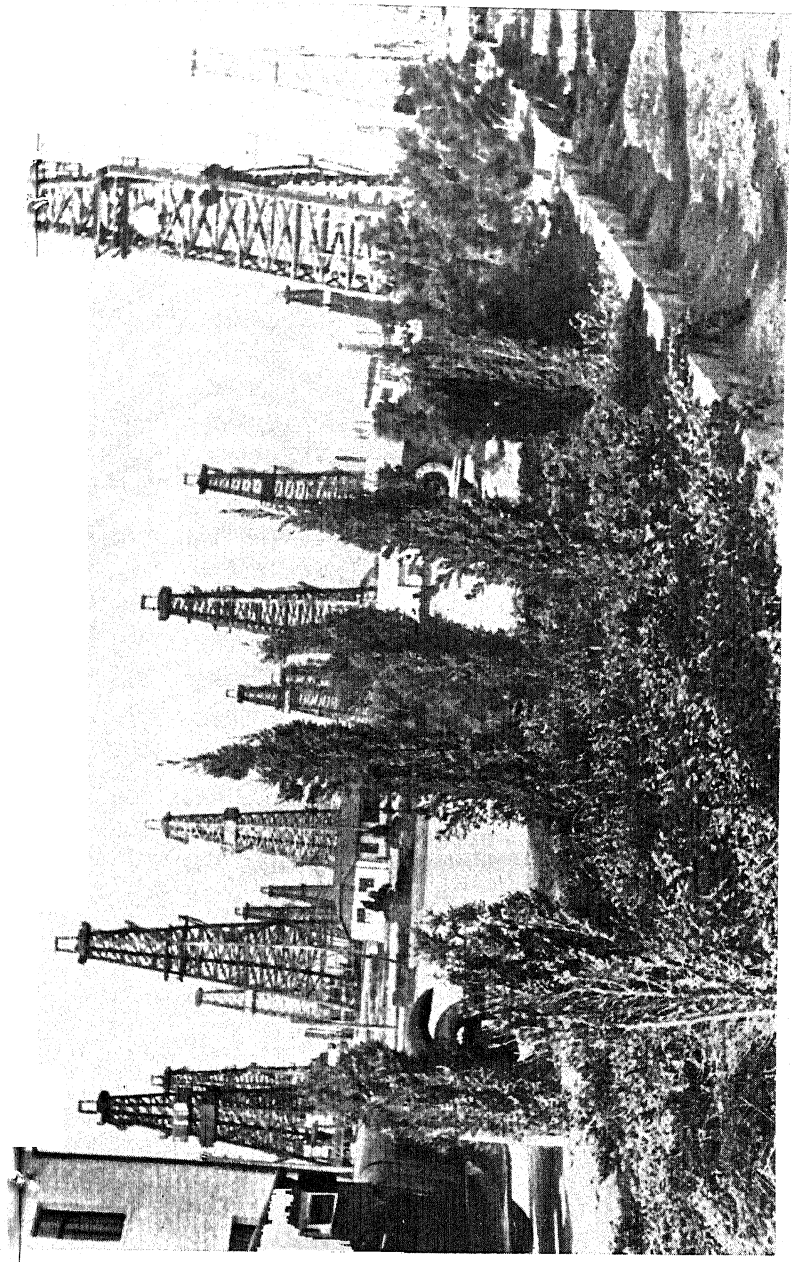
Ragged nomads' tents clustered around the city with its large many-storied buildings. Colonial Transcaucasus remained even more of a peasant country than Russia itself.

Tsarist rule over the peoples of the Transcaucasus rested upon an alliance with the local aristocracy and by supporting feudal circles it helped to maintain the old social forms. The remains of natural economy, feudalism and serfdom, were preserved here—especially in the almost inaccessible mountain regions—right up to the October Revolution, peculiarly interwoven as they were with the elements of developing capitalism.

Today the socialist system of economy is fully realized in the Soviet Transcaucasus, which contributes oil above all in the system of the division of labor between the regions of the USSR. The oil industry accounts for over half the industrial output of the Transcaucasus. Baku (in the Azerbaijan SSR) alone supplies over 70% of the oil extracted in the Soviet Union. During the Soviet period the output of oil has trebled.

There has been a sharp increase in the output of Chiatura manganese ore (in the Georgian SSR) and of copper (in the Armenian SSR). An industry based on the working up of vegetable raw material as well as wine-making, woodworking, food-canning, and others is developing. Large scale cotton, textile, silk, knit goods, and chemical industries have come into existence. During the years of Soviet rule, and especially during the period of the Five Year Plans, the industrialization of the Transcaucasus proceeded rapidly. Like the other national borderlands of old Russia, the Transcaucasus was industrialized at a rate exceeding the average rate of industrialization of the Soviet Union as a whole.

New relations between the former isolated centers and their economic and geographical environment have been formed. Industry is combining with the economy of the surrounding districts. Chiatura manganese is no longer taken out of the region solely in the form of ore, the electric power generated by the local rivers is utilized to manufacture it into ferro-manganese. The tractors used in agriculture, and airplanes which are widely used, make use of Baku oil products, which in former times were all exported. An engineering industry, for which a local steel industry will be created



Oil wells at Baku, center of the rich Caucasian oil fields

during the period of the Third Five Year Plan, has grown up in the Transcaucasus for the purpose of supplying industry with machines and equipment, which were formerly imported.

The Transcaucasus occupies a special place in the agriculture of the USSR. The rich nature of the Transcaucasus and the sub-tropical climate of a number of its regions make it possible to cultivate highly valuable crops which require a hot climate.

In pre-revolutionary Transcaucasus the principal crop cultivated in many regions with the best soils was maize, which occupied a large area suitable for the cultivation of far more valuable crops. The collective farms and State farms of today reserve the best lands for the cultivation of valuable industrial plants and fruits. The area under cotton, grapes, tobacco, and fruits has been greatly extended, while sub-tropical agriculture (tea, citrus plants, tung, rami, etc.) has been developed virtually for the first time. Western Georgia is the principal region of sub-tropical crops in the USSR; this has freed the country from the necessity of importing sub-tropical raw materials.

The area under sub-tropical agriculture in the Transcaucasus is being extended by the uprooting of dense forests, the drainage of quagmires, and by terracing of the mountain-sides. Such work was very difficult in pre-revolutionary backward Transcaucasus, when fifteen peasant households possessed one modern plough in common, and three peasant households possessed one primitive wooden plough. Today the work of reclaiming and terracing the mountain-sides is done on a vast scale; and the collective-farm and State-farm agriculture of the Transcaucasus is richly equipped with tractors and first-rate agricultural machinery.

The mountainous land, with its transport difficulties and the aridity of the eastern regions, were serious obstacles in the development of the economy of the Transcaucasus of former days. Yet nature itself in the rapid rivers of that region provides the means of overcoming these obstacles: potentialities for immense hydro-electric power stations which could feed industry and move trains over the mountains; while its dams could irrigate vast tracts of land. Nevertheless, before the Revolution this power was not utilized

at all; there was not a single large hydro-electric power station in the whole colonial Transcaucasus.

Today the situation is entirely changed; a number of hydro-electric power stations have been built, more are under construction. The mountain rivers provide cheap power, which is required in ever increasing quantities and which is still insufficient in rapidly growing Transcaucasia.

The vividly individual character of the economy and natural conditions of the Transcaucasus, the richness of its ancient, and now regenerated, culture, evoke the deep interest and love of all the peoples of the Soviet Union. This feeling is particularly strong because the Transcaucasus is connected in the minds of the Soviet peoples with the name of their leader Stalin. Here, in the town of Gori, Stalin, the son of a poor Georgian workman, was born, and here he spent his childhood. Here he attended school, started his revolutionary work, was thrown into tsarist prisons, and became the leader of the workers' struggle.

After the October Revolution, and especially during the period of the Five Year Plans, a great change took place in the life of the Transcaucasus. The republics of the Soviet Union, including Azerbaijan, Georgia, and Armenia, achieved signal success in economy and the development of culture, largely through the organizing efforts of Stalin.

A member of the Academy of Sciences of the USSR, I. Gubkin, geologist and petroleum specialist, a world-renowned scientist, when he was elected in Baku to the Supreme Soviet of the USSR, wrote: "I shall never forget the meetings with my electors at which I witnessed scenes which touched me beyond expression. An old and bent Azerbaijan woman, who a year ago, perhaps, still wore the veil, mounts the platform. In a voice that gradually becomes stronger with deep emotion, with all the passion of gratitude which the heart of a woman of Azerbaijan is capable of feeling, she says to the hushed hall:

"Stalin, long live Stalin! He gave us life."

"A storm of enthusiasm brings the people to their feet as soon as this great name falls on their ears."

THE AZERBAIJAN SOVIET SOCIALIST REPUBLIC

The Transcaucasus is connected with the capital of the USSR, Moscow, by a railway which passes through Rostov-on-Don to Baku. As the train crosses the Kuban steppes in the North Caucasus, one can already see the white double-peaked cone of Mount Elbrus looming in the distance above the plains. Later on the whole panorama of the majestic Caucasian Mountain Range opens out. The track passes around it on the east along the narrow coast of the Caspian Sea. At Derbent, where the mountains come close up to the sea, the train runs just above the surf. Here are the ancient "Gates of Derbent," the great passageway for migration from Central Asia into Europe. Beyond this narrow passage lies Azerbaijan.

Once upon a time Azerbaijan was the noisy crossroads of the great trade routes. After many devastating wars it became a nomadic out-of-the-way region, and so remained even after it was annexed to Russia; only isolated capitalistic Baku was a bit of another world—a city of commercial operations and a center of the revolutionary struggle of the workers. Today Azerbaijan, one of the Union Soviet Socialist Republics, is a cultured country with a highly developed industry and mechanized agriculture. During the years 1913-1937 industrial output increased sixfold—within the period of the Second Five Year Plan alone it increased more than twofold. Over 90% of the peasant farms have been collectivized, and over five thousand tractors are in use in agriculture.

Close to three million persons live in Soviet Azerbaijan, which is 33,200 sq. mi. in area; the main part of the population is composed of Azerbaijanians, a Turkic people. Included in the Azerbaijan SSR are the Nakhichevan Autonomous Soviet Socialist Republic (a territory inhabited by Azerbaijanians and surrounded by the territory of the Armenian SSR), and the Nagorny Karabakh Autonomous Region (inhabited in the main by Armenians). Azerbaijan is also inhabited by Russians (principally in the towns, such as Baku), Tats (on the Apsheron Peninsula), Talishes (in the Lenkoran lowlands), and others.

The railway, having passed through the Gates of Derbent and having left the spurs of the Caucasian Mountains, runs along the

seacoast and enters the Apsheron Peninsula. On its south coast, in a deep bay that never freezes, stands Baku, the capital of the Azerbaijan SSR ($42^{\circ} 21' \text{ N. } 49^{\circ} 40' \text{ E.}$).

Baku is one of the largest towns in the Soviet Union. In population (about 800,000 inhabitants), it is approximately equal to Kiev, only Moscow and Leningrad being larger. In comparison with pre-revolutionary times the number of inhabitants has more than doubled. Over three-quarters of the industry of Azerbaijan is concentrated in Baku.

A handsome boulevard, similar to the promenade of Santa Barbara (California), runs for many miles along the blue-green sea. Behind the boulevard is a lively European city with broad avenues, fine many-storied houses, theatres, and public institutions. In the center of the town, on a hillside overlooking the sea, one may see the relics of the Middle Ages: above the modern streets stands the gloomy "Maiden's Tower," built of large gray stones, and the ruins of feudal walls, which enclose a conglomeration of flat cube-shaped houses and crooked streets which are so narrow that, standing in the center of the street one can touch one of its walls with the left hand and the opposite wall with the right. In the suburbs are the districts of new Baku, the finest part of the town; even rows of spacious and comfortable three-storied houses stand in gardens, unknown to old Baku, which had no vegetation whatsoever.

In Baku the winters are comparatively mild (the average temperature for January is 38.3° F.) and the summers are hot (the average temperature for July is 78.2° F.). Precipitation is scant (7.1 in. a year) but winds, especially the north wind, frequently attain the violence of tempests and usually carry clouds of dust with them.

Pre-revolutionary Baku presented the contrasts of civilization and the patriarchal system. The ancient oppression was manifested especially in the position of women; the Azerbaijan woman had even fewer rights than other women of the Mussulman Orient. The black veil covered everything but her eyes—the eyes of a slave. Now the woman of Azerbaijan is free.

A young woman named Chimnaz Aslanova finished a Soviet secondary school and graduated from a university, became a teacher, distinguished herself in her work, was sent to the Supreme Soviet

of the USSR, and was there elected vice-president of one of its chambers—the Soviet of Nationalities. At the present time Aslanova, a member of the highest organ of State authority of the Soviet Union, is director of the Institute of Folklore attached to the Academy of Sciences.

Take the third oil field of the “Orjonikidzeneft” Trust in Baku. It is the best oil field in the USSR. All the workers employed on it are Stakhanovites. In 1938 it fulfilled its plan of oil output long before schedule and was rewarded. This oil field is managed by a young engineer named Sugra Gaibova, an Azerbaijan woman. She has been elected a deputy of the Supreme Soviet of the Azerbaijan SSR.

The Government of the Azerbaijan SSR includes two Azerbaijan women, who hold the posts of People’s Commissar for Health and of People’s Commissar for Social Welfare.

Before the October Revolution there was not a single university in all of Azerbaijan. Today it possesses about twenty institutes and many technical schools—of oil, agriculture, textiles, economics, machine construction, chemistry, pedagogy, medicine, music, literature and other subjects. Over five thousand women attend the universities of Azerbaijan. Before the Revolution there were twelve Azerbaijan engineers; now there are over three thousand. There had been no Azerbaijan agronomists at all; now there are seven hundred. There are over five hundred Azerbaijan professors and scientists. In 1938, 6,175,000 copies of books, most of them in the Azerbaijan language, were published in Baku (in 1913 only 112,000 were published in the Azerbaijan language).

An electric railway runs from Baku Station, built in the Moorish style, into the interior of the Apsheron Peninsula; this was the first electrified railway in the USSR, having been constructed in 1926. The track leads to the oil fields. Workers’ cottages line the railway. Then thousands of derricks standing close together appear. All around lies the parched, barren and oil-drenched land.

The Apsheron Peninsula is an oil region of world importance. Huge gushers spurt out of the land from time to time; at the end of 1937, oil gushed out of a pit-hole from a depth of 8,648 feet. Before the Revolution the oil deposits were not estimated, and

there did not even exist a geological map of the oil fields. The Apsheron Peninsula has now been thoroughly explored, and its oil deposits, found to be quite exceptional, are estimated at 2.5 billion metric tons. The oil lies principally in the tertiary-pliocene sand-and-clay stratum, which is extensively faulted and productive. Within recent years the oil industry is developing in newly prospected oil fields outside the Apsheron Peninsula to the south of Baku.

In the seventies of the last century, when Russia was importing kerosene from the United States, the first large oil enterprises were created in Baku. In the nineties, Baku caught up with the U.S.A. in oil output. After 1901, the year of maximum output (eleven million metric tons), when Baku supplied half the world's output, the oil industry of Baku was in a state of stagnancy right up to the Revolution. In 1913, the last pre-war year, 7.7 million metric tons were extracted there. At that period only 5.9% of the oil in Russia was extracted by mechanical means.

The years of the Five Year Plans were a period of the rapid growth of the oil industry of Baku: the output of 1938 was 22,400,000 metric tons of oil, three times as much as that of 1913. This growth was a result both of the exploitation of deeper strata in the old oil fields (Sabunchi, Sirakhan, Artem Island, and others), and of the prospecting of new oil fields (Zikh, Kala, Lok-Batan, Kerghez, Kzil-Tepeh, Shangar, Sulu-Tepeh, Pirsagat, and others). Part of the oil is extracted from under the sea. Eighty-three per cent of all the oil in 1938 was extracted in new oil fields and from new strata in the old oil fields.

Oil extraction and drilling are highly mechanized and electrified. One walks amidst pit-holes in operation and sees hardly any people. Oil extraction in the USSR is now 98% mechanized.

Within the period of the Second Five Year Plan the rate of drilling in Baku increased more than threefold, notwithstanding the fact that the average depth of the wells increased two-and-a-half times. At the end of 1938 the deepest well in the USSR (11,391 feet) was drilled in Baku. The rate of drilling at great depths is higher than drilling rates in America.

The oil is refined at the works of the Black and White [Old

and New] towns adjoining Baku; within the period 1913-1937 the output of gasoline increased forty-eight times. A large-scale and varied chemical industry has sprung up in the Soviet period in connection with oil-refining. At the present time a new powerful region of chemical manufactures (soda, fertilizers, synthetic rubber, etc.) based on a large electric power station, is growing up in the north of the Apsheron Peninsula.

The Baku electric power stations work on natural petroleum gas which was hardly utilized at all before the Revolution. Within the period 1934-1939 the extraction of gas nearly doubled; the capacity of the electric power stations of Azerbaijan increased from 73,000 to 248,000 kwts. within the years 1924-1938.

Large quantities of oil are transported from Baku to Astrakhan via the Caspian Sea; from Astrakhan the oil is carried along the Volga and distributed over the country. Part of the oil is transported to Port Batumi on the Black Sea by rail and through oil pipe-lines; there it is refined and then exported.

In addition to the oil industry Baku possesses an engineering industry (the manufacture of equipment for the oil industry), and also a textile and a clothing industry. An important iodine and bromine extraction industry has sprung up near Baku based on deposits in the pit-hole waters.

The environs of Baku consist of a semi-desert tract with low mud volcanoes and scant vegetation. Nevertheless, recently with the aid of wells and electric pumps, extensive utilization of underground waters has begun and the collective farms are obtaining heavy crops of grapes, olives, pistachios, almonds, figs, and vegetables. Apsheron is the only place in the USSR where saffron is cultivated. These new plantations have in turn become holiday resorts for the urban dwellers, who reach them by modern electrified railroads.

To the south of Baku lies the extensive Kura lowland district, traversed by the River Kura and its tributary the Arax. Here lies the Shirvan, Mil, and Murgan steppes, a semi-desert expanse with a dry sub-tropical climate. Snow scarcely ever falls and for this land spring begins in January. By summer the plain is scorched by the sun.

Even before the Revolution cotton growing had begun to develop on the artificially irrigated fields of the Kura lowlands, but the area of the plantations was not large. During the period of the Five Year Plans great irrigation systems were constructed which vastly increased the area under cotton. The finest species of long-fibred Egyptian cotton were planted. State farms using mechanical irrigation were created and developed town-like settlements. Scores of the best collective farms obtain a yield of over 8,800 pounds of cotton per acre, while one collective farm (in the Kussum-Izmail District) obtained a hitherto unprecedented harvest of 13,350 pounds of cotton per acre. In addition to cotton, lucerne, wheat, and rice are sown in the Kura lowland district.

In climate this region is similar to Egypt, but until now only a small area had been developed agriculturally owing to the low water supply and the difficulty of raising it to the level of the fields. Vast tracts are used for livestock-raising; in winter, when grass appears once again after the dry summer, following the autumn rains, the cattle are sent out to graze here, while in summer they are driven to the mountain pastures. During the period 1934-1938 the number of sheep and goats increased by 52%. Cattle-breeding in the Kura lowlands is being aided by laying in fodder for the winter.

At the present time a vast enterprise has been undertaken which will alter the whole aspect of the region. During the period of the Third Five Year Plan a hydro-electric station with a capacity of 300,000 kwts. will be built on the river Kura in a ravine by the village of Mingechaur (14 miles from the town of Yevlakh). The dam of the station will be 242 feet in height. A reservoir, 17,346,000,000 tons in volume, will be made. After the cutting of drift canals, the cotton plantations will increase in area from 371,000 acres to more than two and a half million acres. The flow of the Kura will be regulated. One hundred and thirty-five villages and 123,500 acres of fields will be delivered from the constant menace of floods. The swamps will disappear—and malaria with them. Electric transmission will be laid from the station to Baku.

Fishing is conducted on the sea-coast of the Kura lowlands. This district exports its sturgeon caviar to markets all over the world.

An industry manufacturing fish products has been created. The catching of gray mullet has commenced: the fry of this fish was transported by airplane from the Black Sea to the Caspian a few years ago.

The Kzil-Agach Preserve has been created on the sea-coast on the lower reaches of the Kura. It lies in the extreme south of the USSR, but it is of immense importance for hunting in the Soviet North. Flamingoes live in the Preserve, and aquatic and marsh birds—geese, ducks, and swans—which migrate here from the north, winter in this district under the Preserve's protection.

To the south of the estuary of the Kura, just by the Iran frontier, lies the narrow Lenkoran lowland district, protected by the wall-like Talish Mountains, which attain a height of 8,500 feet. This is a humid sub-tropical district, with precipitations amounting to about 46.8 inches a year; the Lenkoran highlands differ from the subtropics of the Western Transcaucasus in the dryness of the summer. Dense forests with a number of species of trees of the tertiary period cover the mountain-sides and the plain; the most outstanding tree is the ironwood, which is remarkable for its extraordinary durability. There are many lianas. The Indian humped ox, the zebu, is the domestic animal of this region.

This region was extremely backward. Rice was cultivated in the lowlands. But a few years ago the local village postmen used to complain that tigers hindered them in their work.

Today, on Stalin's initiative, sub-tropical cultivation has begun in the Lenkoran district. An agro-technical process—artificial shading—is applied to counteract the heat in summer. Within the period 1934-1938 the area of the tea plantations increased from 292 to 7,586 acres and a tea factory has sprung up in the town of Lenkoran. Tangerines, lemons, tungs, bamboo, and eucalyptus, are also cultivated.

From Baku the railway penetrates into the heart of the Transcaucasus. At first it runs south along the Caspian coast, but later turns to the west and passes into the plains of the Kura lowlands. This is an arid, waterless, and monotonous district. It becomes animated only in late autumn when the immense herds of the collective farms and State farms descend from the mountains and

shearing and slaughtering are begun. Cotton oases and vineyards are scattered here and there.

In Yevlakh the railway crosses the river Kura. Important motor-roads run north and south, at right-angles to the railway, from Yevlakh.

North of Yevlakh, in the folds of the Main Caucasian Range along the tributaries of the Alazani, lie regions which are well-known for their silk-worm breeding, horticulture, tobacco cultivation, walnut crops, and handicraft industries (carpet-weaving and others). One of the largest silk combines in the world has been built in Nukha; before the Revolution the cocoons used to be exported from the Transcaucasus abroad. A huge nut-shelling factory has been erected in Zakatali.

To the south of Yevlakh, in the mountains of the Little Caucasus, lies the autonomous region of Nagorny Karabakh (1,660 sq. mi.). Its capital is Stepanakert. Nagorny Karabakh is inhabited mainly by Armenians, and also by Kurds. This is a region of gardens, vineyards, silk, and highly valuable tawny "Karabakh" horses.

Above the forest zone lie rich Alpine meadows. These are the "eilags"—the summer pastures of the herds which are driven here every spring from the winter pastures of the Kura lowlands. Collectivization has instituted planned regulation of the migration of cattle and the introduction of better routes. A system of veterinary examination has freed Azerbaijan cattle-breeding of the eternal menace of cattle disease.

Still further south of Nagorny Karabakh and situated on the river Arax in the mountains between the Armenian SSR and Iran, is the Nakhichevan Autonomous Republic (2,280 sq. mi.) which forms part of the Azerbaijan SSR, but is separated from it by mountains which belong to the Armenian SSR. Mainly Azerbaijanians live here. The chief town of the republic is Nakhichevan-on-the-Arax. Cotton is cultivated on the lowest levels; fruit, grapes, and tobacco are grown higher up; sheep-breeding is developing at still higher levels. Under Soviet rule an industry working up agricultural raw material has been created here. The Nakhichevan ASSR supplies the whole of the Transcaucasus with salt.

In the Nakhichevan Republic the collective farmer Elias Mus-

taphaev, a deputy of the Supreme Soviet of Azerbaijan, established the world record for cotton-picking of 4,600 pounds in only one working-day.

From Yevlakh the railway runs in a westerly direction and soon arrives in Kirovabad (formerly Yelizavetpol or Ganja). This is a new industrial town of Azerbaijan which has grown up rapidly. A large cotton combinat and an oil-press among other enterprises, have arisen here. In 1923 a cloth factory was transferred by decree of the Soviet Government from Tambov (south of Moscow) to Kirovabad: this is an example of the aid given by the center of the country to the industrialization process of the national outlying districts which was just commencing. To the southeast of Kirovabad a large hydro-electric station is in the course of construction on the river Terter which will supply the town with electric power.

An important mining district is forming in the spurs of the Shah-Dag Range, to the south of Kirovabad. Deposits of various minerals, some of which are already being exploited, are concentrated here over a comparatively small area. There is magnetic iron-ore in Dashkesan, alumina (the raw material for aluminum) in Zaglik, copper ore in Kedabek, pyrites in Chiragidzor, barites in Chovdar, and others.

From Kirovabad the railway runs in a northwesterly direction along the Kura. The mountains draw close together, forming a wide corridor filled with vineyards. Beyond Axtafa, Azerbaijan ends and Georgia commences.

THE GEORGIAN SOVIET SOCIALIST REPUBLIC

The Georgian Soviet Socialist Republic occupies an area of 26,875 sq. mi. This territory is inhabited by three and a half million people. The main part of the population consists of Georgians, the most numerous of the peoples in Transcaucasia. The Georgians are subdivided into several groups (Kakhetians, Imeretians, Svaneians and others).

The Georgians are an ancient people with a highly developed culture. The Georgians came from Asia Minor to the Transcaucasus and have been living here for at least 3,000 years.

Georgia is also inhabited by Armenians (especially in Tbilisi), Russians, Abkhazians, Ajarians, Ossetians and other nationalities. Of all the republics in the Transcaucasus, Georgia has the greatest average density of population.

Forming part of the Georgian SSR are the Abkhazian Autonomous Soviet Socialist Republic, the Ajar Autonomous Soviet Socialist Republic and the South Ossetian Autonomous Region.

In the Caucasus, and in Georgia in particular, the costume of the Caucasian mountain dwellers is still worn by many. It consists of a well-fitting Circassian long coat reaching the knees, with a row of silvered cartridge cases on the breast, a dagger at the belt, soft boots, a flat sheepskin cap, and a hood hanging over the shoulders.

To the national economy of the USSR Georgia contributes its sub-tropical agriculture, the wine industry, and manganese mining. In the economics of Georgia itself a very prominent part is played by the newly created engineering industry, light industry, the timber and other industries.

During the years of Soviet power, when the industrialization of the Republic was effected, its industrial production increased twentyfold. The proportion of industrial output in the production of the entire national economy of formerly agrarian Georgia has risen to 75%. This rise in the proportion of industry has been accomplished by the absolute growth of agriculture, the area under grain crops having increased by 50% and that under industrial crops by 150%.

Georgia has become a land of complete literacy. There are eighteen universities here with 22,000 students.

The railway train from Moscow, having passed through Azerbaijan, enters the bounds of Eastern Georgia to the west of Axtafa at the Karayazy steppe occupied partly by cotton plantations and partly by winter pastures.

The train soon arrives at Tbilisi (Tiflis), capital of the Georgian SSR (41° 42' N. and 44° 50' E.). Up to 1936 Tbilisi was the capital of the entire Transcaucasian Federation.

Tbilisi is the railway center of the Transcaucasus; from its railway junction lines run southeast to the Azerbaijan SSR, west to the Black Sea Coast and south to the Armenian SSR.

Tbilisi lies at a height of 1,330 feet above sea level in a hollow surrounded by bare mountains. Through the city, in a deep rocky channel, runs the turbid and rapid river Kura. Here there is pure mountain air, a hot summer (the average temperature in July is 76.1° F.) and a very mild winter (the average temperature in January is 35.6° F.). The annual total precipitations amount to 20 inches.

Tbilisi has been in existence for at least 1,500 years. It has seen Khazars, Huns, Byzantians, Iranians, Mongols, Arabians, Seljuk-Turks and Osman-Turks. Marco Polo writes about Tbilisi. From the distant past Georgian temples with sharp cone-shaped domes, and the ruins of fortresses, have been preserved in the city. Ancient districts with tiny narrow streets, and balconies over the river Kura, are situated around the hot sulphur springs (with a temperature up to 116.5° F.) on which the famous Tbilisi baths have been built.

The old part of Tbilisi is lost amidst the modern European district with its many splendid boulevards, asphalted streets and numerous large buildings of which the best, including the magnificent Government House, have been erected in recent years. Along the Kura, over which the rims of primitive wooden wheels were still revolving not long ago, a fine embankment has been constructed. Tbilisi is dominated by the steep wall of Mount David; a funicular railway runs to the summit of this mountain which is a favorite spot for rambles and excursions. From the mountain a view opens on the entire city of Tbilisi, its districts on the hills resembling a honeycomb. The inhabitants of Tbilisi love to stand on this high spot at night and look at their city, a cluster of blue lights twinkling in the darkness below.

Prior to the Revolution Tbilisi was the residence of the tsarist vice-regent in the Caucasus and bore a bureaucratic aspect. Its industry was not large, the most important branch was the repair of locomotives and railway cars. There are, however, old revolutionary traditions among the Tbilisi workers. In Tbilisi, too, Stalin began his revolutionary activities.

During the years of the Five Year Plans, Tbilisi became an important industrial center. An engineering industry has been estab-

lished in the city for the production of machines for Transcaucasian industry: oil, tea and wine. Knitted goods factories, and cloth and silk weaving mills have been built; a new boot-and-shoe factory produces four million pairs of boots and shoes yearly. For light industry, Tbilisi occupies first place in Transcaucasia. South of Tbilisi, in a canyon of the river Khrami, a high pressure hydroelectric power station, 90,000 kilowatts in capacity, is under construction.

Splendid theatres have been established in Tbilisi. Among these the Rust'hveli Dramatic Theatre and the Tbilisi Opera Theatre are especially distinguished.

East of Tbilisi a branch line runs to Kakhetia. That is the name of the part of the Georgian SSR lying in the valley of the upper reaches of Alazan River, the left tributary of the Kura River. Kakhetia lies under the steep slope of the Main Caucasian Range and is well protected by the mountains. Here there is much warmth and light, and a fertile soil. Snow does not stay long, and some years there is no snow at all in Kakhetia. There are years when almond trees and field flowers are already in bloom in January, and in February, apricots, peaches and pears. Kakhetia is almost one continuous vineyard. Grapes are cultivated on the mountain slopes to a height of 2,960 feet. The Kakhetian wines, "Napareuli," "Tzinandali," and other brands, are among the best in the USSR. The champagne production is increasing. In Georgia a great combinat for making champagne wines, whose annual output will amount to four million bottles of champagne, has been created. Besides grapes, tobacco is also grown in Kakhetia. A few years ago oil was struck here in the Shirak steppe.

North of Tbilisi to the town of Orjonikidze, situated in the North Caucasus, runs the famous Georgian Military Road stretching for about 133 miles. It is a splendid highway traversing the Main Caucasian Mountain Range, winding through the deep valley of the rapid Aragva River, amidst wooded mountains; gradually rising it approaches the watershed ridge, climbs its steep wall by way of a difficult serpentine path, and, through Krestovy Pass (7,795 feet) descends to the northern slope; after passing not far from the snowy pyramid of Mount Kazbek, along the narrow

Daryal Gorge, it emerges on the plain of North Caucasus. From days of old this passage was the gateway from Transcaucasia to the North. It is mentioned by Pliny.

From Tbilisi in a westerly direction to the Black Sea Coast runs a railway which a few years ago was electrified for a distance of 155 miles. This line crosses the whole of Georgia.

At first we see long stretches of fields irrigated by the water of the Kura by means of electric pumping stations. The train then arrives in the town of Mtskheth standing at the confluence of the rivers Kura and Aragva.

This town is older than Tbilisi. It had already led a long, intensive life before our era. Up to the 6th century Mtskheth was the capital of Georgia. There is a temple here which is 1,500 years old. On a high bare peak over Mtskheth, as though a part of the natural landscape, are piled the dark ruins of a feudal castle. Under the castle stand the main constructions of the "Zages" (Transcaucasian Hydro-Electric Power Station) damming up the Kura. This station, 37,000 kilowatts in capacity, was built under Soviet rule. The concrete dam is crowned by a monumental statue of Lenin.

After Mtskheth the electric train runs further west up the Kura valley which may be called the axis of Eastern Georgia.

The air here is light and clear, the sun hot and vivifying. The landscape is softened by gentle outlines of mountains, the foothills of which are hidden in orchards and vineyards. Tiled roofs of collective-farm villages appear amid the verdure.

On the bank of the Kura, surrounded by orchards, stands the small town of Gori. It was here that Stalin was born in 1879. The one-storied brick house is now protected by glass, faced with marble, and surrounded by a fence. The house has been turned into a museum and everything remains there as it was in the years of Stalin's boyhood. The school which he attended has been preserved. Thousands of people from all parts of the Soviet Union come to Gori every year.

From Gori towards the north, away from the railway, runs an automobile road to Staliniri, the center of the South-Ossetian Autonomous Region (1,425 sq. mi.) which forms part of the Georgian SSR. It is a highland country at the foot of the Main Caucasian

Mountain Range, engaged in livestock-raising, fruit-growing, and the timber industry. The country is mainly inhabited by Ossetians. To the north of the lofty Caucasian Mountains, opposite the South-Ossetian Autonomous Region, is situated the North Ossetian Autonomous Republic, which forms part of the RSFSR and is also inhabited principally by Ossetians.

West of Gori the railway line runs close along the Suram Mountain Range. The Kura River Valley turns to the southwest, in a deep sylvan ravine to Borzhomi, the famous health resort with its hot (72.5° F. and 83.3° F.) carbonic acid and alkaline springs which for their composition are similar to the waters of Vichy (France). Besides Borzhomi there are many other health resorts in this district, all of them situated in most picturesque spots amidst mountains that still bear traces of the Georgian Middle Ages in the shape of ruined fortresses. Over Borzhomi, in the pine-covered mountains, and just under the zone of alpine meadows, stands the Bakuriani Mountain and Climatic Station (5,453 feet above sea level), a center of winter mountain skiing.

As long as the train runs through the Kura River Valley, barred in front by the wall of the Suram Range, a certain dryness is still felt in the air; the sphere of influence of the continental climate of Anterior Asia still continues. But now the train has come right up to the mountain range. The electric locomotive has drawn it up to the entrance of the two and a half mile tunnel. The ringing of an automatic bell indicates that the highest point of the pass has been passed. The train emerges from the tunnel at the western slope of the Suram Range, and immediately enters another climatic world, the sphere of the humid Mediterranean.

Here begins the basin of the Rion River, open to the winds of the Black Sea. The air is saturated with moisture. Heavy torrents of rain, which cause the river to seethe, are frequent. The mountain slopes and lowlands are densely overgrown with trees intertwined with liana.

The electric railway makes a steep descent from the Suram range along ledges that are frequently artificial, passing over a deep precipice with a swift mountain stream below. At the foot of the descent is Sharopani Station. Here, from a side gorge, flows the Kvirila

River, in whose waters can clearly be discerned the dark brown currents brought from the upper reaches where the famous Chiatura manganese mines are located, connected by a branch line with the main railway. Chiatura is one of the most important deposits in the world both for the size of the deposit of manganese and the percentage content of the ore. During the Soviet years the mining of manganese ore has been mechanized and the output has greatly increased. In 1932, for example, the output of manganese was 385,000 metric tons, while in 1937 it was 1,650,000 metric tons, *i.e.* within five years the output increased by 330%. A powerful plant producing ferro-manganese has been built at Zestafoni Station. Part of the manganese is exported through the Port of Poti.

The railway emerges on the Rion Plain. Not far from the city of Kutaisi, the "Rionges" (Rion Hydro-Electric Power Station), 43,000 kilowatts in capacity, has been built. The water for the turbines of this station is delivered through tunnels.

All the largest electric power stations of Soviet Georgia (Rionges, Zages and Tkvarchelges) are combined in one high voltage power grid. Small hydro-electric power stations are being built in collective farms. Soviet Georgia will be entirely electrified within the next few years.

Kutaisi, which lies at the point where the Rion emerges from the gorge on the plain, is the largest city in the upper section of this river—the part of Western Georgia called Imeretia. There is much vegetation here, and almost no winter. In recent years Kutaisi has become an important town producing silk, cloth, clothing, and canned goods. A chemical combine which will produce fertilizers is being built in the vicinity of the town. Near the town are the most important barite deposits in the USSR. Coal is mined in Tkvibuli, situated at a distance of 27 miles from Kutaisi.

North of Kutaisi, surrounded by the spurs of the Main Caucasian Range, to which access is difficult, lies Svanetia, a region of highly individual aspect. On all sides of this beautiful country tower huge snow-capped mountains, among them the imposing mountain of Uzhba (15,414 feet), whose summit resembles two sharp horns.

Not so long ago not a single vehicular road penetrated into Svanetia. Feudal relations were retained longer in this isolated coun-

try than in any other part of Transcaucasia. Feudal survivals, including the terrible custom of the blood feud, existed in Svanetia up to the very moment of the Great Socialist Revolution. In the villages of Svanetia they can be traced to the agglomeration of tall stone towers with merlins and loop-holes. These towers were built by almost every family of Svanetians as a protection against their vendetta enemies, that is, enemies who avenged murder by murder.

Soviet rule has rid Svanetia of the survivals of the past. Svanetia is now a land of collective-farm peasantry with a mode of life similar to that obtaining throughout the Soviet Union. Here, as everywhere, schools and hospitals are being built; pastures and fields have been handed over to collective farms for economic use in perpetuity; the standard of living of collective farmers is determined by the quantity and quality of their personal labor, now unhampered in its development.

In Svanetia, along the Ingur River, an automobile road has been constructed which connects this previously out-of-the-way province with the entire country. A hydro-electric power station has been built in Mestia, in Central Svanetia. A regular air service connects Mestia with Tbilisi. For the first time the rich Svanetian forests are being exploited; the timber is rafted down the Ingur River to the new cellulose-paper combine which has been built near the town of Zugdidi in Western Georgia.

In the north, Svanetia is adjoined by the highest and entirely snow-capped part of the Main Caucasian Range, the principal Alpine region in the USSR. In recent years mountain climbing as a sport has begun to interest larger and larger numbers of people in the Soviet Union. Twenty-one hundred persons climbed to the peak of Mt. Elbrus (18,468 feet), the highest mountain in the Caucasus and Europe, in 1935, while prior to the Revolution only a few persons reached that peak. At the very summit of Elbrus, on the névé slope, a hotel has been built. In 1935, of the expert Alpinists of the USSR 35% were Red Army commanders and soldiers, 27% collective farm peasants, 13% workers, 18% students and 7% scientists and office employees.

Leaving the Kutaisi district and changing the electric locomotive for a steam engine at Samtredia Station, the train penetrates into the

Rion lowlands. The mountains are left behind and little by little recede into the distance. Thirty miles still remain to reach the sea, which is not yet visible, but the horizon in front is open and the proximity of the sea is felt in everything. It is hot and damp as a hothouse. The air is heavy and humid. The soil is saturated with moisture. There are numerous marshes, and jungles of bushes and high grass. Heavy carts are harnessed with buffaloes. The white buildings of malaria stations are seen in the villages. Peasant houses with overhanging terraces are concealed in the thick verdure. The houses stand on high stone pillars to protect them from the dampness. We arrive at Colchis.

After Lanchkhuty Station a blue strip of the sea can already be seen. The train runs south along the seashore. The hillside looks as though it were frilled: it is covered with terraced tea plantations. People are at work on them in broad-brimmed straw hats.

The Rion (Colchis) lowlands in the south stretch to Kabuleti (north of Batumi), in the north to the mouth of the Kodor River (south of Sukhumi), in the east almost to Kutaisi, while in the west it is bounded by the Black Sea shore. Approaching it in climate are the lower slopes of the surrounding mountains, and in particular, the district of Batumi.

From west to east, over a distance of about 55 miles, Colchis is intersected by the Rion, at whose mouth lies the Port of Poti. Parallel to the Rion run the Ingur, Khopi, Supsa and other rivers. All these rivers have their source in the mountains whence they carry large quantities of silt which is deposited on the plain and raises the level of the river-beds. The surplus water overflows, especially during violent downpours when the level of the river rises at once. The sand bank pushed up by the surf does not allow the overflowing water to run into the sea. Thus the Colchis marshes are formed.

The Black Sea coast of Georgia is a humid sub-tropical region. Precipitations, chiefly in the form of brief torrents of rain, amount approximately to 59 in. a year, and in some places to as much as 98.4 in.—a condition to be found nowhere else in the USSR. In many places the rainfall in August exceeds 7.8 in., an almost tropical

phenomenon. It once happened in Poti that the rainfall in one day was as high as 8.1 in.

Protected by the mountains from the cold winds and heated by the warm sea water, the Black Sea coast has a hot summer and, what is still more important, a very mild winter enabling plants to vegetate all the year round. In Poti the average annual temperature is 57.7° F., while in January, the coldest month, the temperature is 40.8° F. Absolute maxima in some years may attain over 64.4° F. in January. What is essential, however, is that frosts occur sometimes in the winter, although they are not very sharp. On an average there is only one day of continuous frost during the year. The average temperature in Batumi in January is 43.3° F.

Of highly individual character is the wild vegetation of Colchis. The dense forests of alder, willow, lapinum, oak, and hornbeam are intertwined with liana. There is an abundance of fern which, in the course of one summer, grows to the height of a man. There are evergreen varieties: box-tree, cherry laurel, Colchis ivy, and other plants. The tall alder tree grows on the red soil here in two or three years; the artificially planted bamboo attains 49 feet in height.

In the ice-age the Western Transcaucasus was a refuge which preserved the heat-loving flora of the tertiary period. To this belongs, for instance, the lapinum.

It is possible to cultivate sub-tropical and even certain species of tropical plants on the Black Sea coast of Georgia. Thousands of species of plants from China, Japan, Australia, India, and South America can grow here. Nevertheless, with all its fertility, the Black Sea coast of the Caucasus remained almost unexploited in the past. The peasants of malarial villages sowed maize on a soil in which a ton of grapefruit could be obtained from one tree. No attention was paid to Colchis by national economy and science. Even P. P. Semyonov-Tyanshansky, one of the most prominent geographers of old Russia, wrote in 1900: "In Western Transcaucasia the choice of cultured plants is fairly difficult in consequence of the warm and damp climate." Only on high spots by the sea did Russian capitalists build villas with comparatively insignificant orchards nearby.

At that very time Russia was buying all its sub-tropical raw materials abroad, paying in gold for the products of Sicily, Ceylon, and Algiers. Before the war the country imported sub-tropical raw material to the value of nearly 200 million rubles annually, including tea to the value of 60 million rubles and citrus fruits to the value of 12 million rubles.

In the USSR, the development of industry and the rise of new branches of industry created a demand for new varieties of raw material from plants, such as tung oil, tanning substances, and so on. With the rise in the well-being of the masses, the demand for valuable vegetables and fruits increased. All this, together with the struggle for the economic independence of the country, has led to the rapid establishment of sub-tropical farming in the USSR, its main region being the Black Sea coast of Georgia, and in particular, Colchis.

Large mechanized state farms were organized. The collective farms changed the structure of agriculture: instead of maize, which occupied the whole of the land under crop, the collective farms are beginning to cultivate valuable sub-tropical plants.

Tea, citrus fruits, and tung are the crops to which attention is specially devoted in the sub-tropics of Western Georgia.

In 1917 the area under tea in Western Georgia amounted to only 2,400 acres, while in 1937 the figure had increased to 111,640 acres. The crop of green tea-leaves increased to 27,200 metric tons during the Second Five Year Plan period, a growth which resulted from both the increase in the sowing area and the increase in the crop yield. The average yield of green tea-leaves was 625 lbs. per acre in 1932 and 1,880 in 1937. Many of the State and collective farms have overtaken India and Ceylon in the average yield of tea, while the Salibaur State Farm in Ajaria obtained 8,065 lbs. per acre from its plantation, thereby establishing a record. Usha Akhuba, an Abkhazian woman collective farmer and deputy of the Supreme Soviet of the USSR, set up a record for tea-harvesting in 1938 by gathering 737 lbs. in one day instead of the usual 17 lbs.

In Georgia 34 first-rate tea factories have been built. Within the next few years the USSR will grow tea sufficient to supply its entire demand.

The area under citrus trees (tangerines, oranges, and lemons) was 395 acres in 1917 and over 25,000 acres in 1938. By the end of the Third Five Year Plan the area under citrus in Georgia will exceed 61,800 acres. The cultivation of grapefruit has been introduced into the USSR for the first time. With the growth of the trees and improvement of agro-technique, the crop of citrus fruits is increasing year by year. The yield of tangerines from one tree, for example, increased 8.7 times on an average during the Second Five Year Plan period.

The tung tree is being cultivated in the USSR at an even higher rate than other sub-tropical plants. In 1937 the yield of the tung plantations amounted to hundreds of tons of the first industrial produce.

A virtually new industry, the production of natural essential oils from aromatic plants (the Kazanlyk rose, the geranium, sage, lavender, lemon sorghum, the Parma violet, and other plants) has come into existence in the USSR; before the Revolution Russia depended almost entirely upon foreign countries for its essential oil requirements. On 13 large specialized state farms and 4,000 collective farms in the USSR, 24 essential oil-bearing plants are cultivated over an area of 412,700 acres, a figure which will be greatly increased within the next few years. Twenty-five permanent essential oil extraction mills have been established. During the Second Five Year Plan State farms doubled the harvest yield of the Kazanlyk rose, more than doubled the yield of lavender, and increased the harvest of geranium more than fourfold. Among the districts in the USSR cultivating essential oil crops, Western Georgia is one of the most important.

Extensive cultivation has begun of the eucalyptus, which, as is well known, is important both as an essential oil and as ameliorative and hygienic plant. In Colchis the eucalyptus attains a height of between 25 and 30 feet in five years. More than a million eucalyptus trees have already been planted in the soil and millions of saplings are being cultivated.

Experiments with the cinchona tree are being conducted on semi-industrial lines. Judging by the results obtained during the last two years it may be anticipated that the problem of Soviet

quinine will be solved in the very near future. By means of selection, scientists succeeded in transforming the large perennial cinchona tree into an annual herb, which is more suitable to the climate of the Soviet sub-tropical regions.

Rami (Chinese nettle), from which strong fibre is obtained, is being cultivated. The problem of the mechanical working up of rami has been solved.

The eucommia gutta-percha, laurel nobilis, Japanese diospyros kaki (wild date), feijoa (orthostemon) sellowianay, pecan nut, bitter orange and other trees have been introduced.

For their area the Soviet sub-tropics are not very extensive but planned economy makes it possible to utilize them to the maximum extent and to the best advantage. The area of the sub-tropical regions of the USSR is sufficient to satisfy the requirements of the country in sub-tropical raw material to the full.

The fundamental problems that have to be solved in connection with the development of sub-tropical farming in Western Georgia are protection against frost, the terracing of slopes, and the drainage of marshes.

There are days in winter on the Black Sea coast of the Caucasus with frosts a few degrees below zero, which may have a baneful effect on the more tender plants. Here the cold is combated by wrapping up the plants, regulating the thermal regime of the soil, and heating the plantations. A Soviet engineer has constructed a warmer for the citrus plantations which utilizes the fuel twice as economically as the ordinary American warmers, and, based on a new principle, warms the trees better than the American appliances. But the most radical means of fighting the cold is the work of cultivating new frost-resisting varieties of plants by methods of selection. In the Soviet sub-tropics, for example, a trailing form of lemon has been produced which is remarkable for its great frost-resisting property.

In places torrential rain may threaten to wash away the mountain soils. To avert this danger the slopes are terraced, with the aid of tractors.

Sub-tropical plantations are most numerous on the lower mountain slopes to the south of the Colchis lowlands (in Ajaria) and

to the north (in Abkhazia). To extend the sowing area and to make the locality more healthy, work has been started on the drainage of the Colchis lowlands. For this purpose a special organization, known as "Kolkhidstroï" (Colchis Construction Organization) has been established. It is richly equipped with excavators, hydro-monitors and other machines. Canals are constructed and the level raised by deposits of alluvium silt.

Nearly 50,000 acres have already been drained in Colchis. The Rion River has been banked up to a height of 16 feet and in this way nearly 8,000 farms are protected against periodical flooding. In the Poti district a new direction has been given to the current of the Rion. A network of draining canals has been constructed. By the end of the Third Five Year Plan period 123,500 acres, out of a total area of 546,000 acres, will be drained.

Collective farms have been organized on the drained fertile lands. New houses have been built for settlers from the mountain districts and credits granted to enable them to purchase cattle and agricultural implements. Sub-tropical plantations, including a State grapefruit farm, have been established.

The reclamation of the marshes, the pouring of oil on them, and the mass hatching of certain little fish which eat up the larvae of the mosquito, have sharply reduced the number of malaria cases.

Collectivization and the new industry—the cultivation of marketable industrial crops—have changed the life of the Colchis peasantry.

Take, for example, the "Voroshilov" Collective Farm in the village of Dagva. It has received 3,303 acres of land for use in perpetuity. On the eve of the Revolution there were 17 acres under tea and 12 acres under citrus trees in Dagva; today there are 1,000 acres under these sub-tropical plants. In 1937 the collective farm made an income of 2,700,000 rubles, of which 2,400,000 rubles were divided among the collective farmers and the rest used for public welfare. In the harvest yield of tea the collective farm in 1932 overtook the average yield of India, in 1935 the average yield in Ceylon and Java, and in 1937, having obtained 3,830 lbs. per acre, it surpassed the average yield of all countries.

Or take the "Orsantia" Collective Farm on the Ingur River. The

high incomes (for instance, a collective farmer named Sajia, together with her family, earned 20,000 rubles in 1937) made it possible to revolutionize the entire life of the village. A two-storied school, a brickyard, a club for 300 people, two sawmills, a drug-store, and a maternity home have been built. Such establishments would have been inconceivable in the old Georgian village. Electric light has been installed. Before the Revolution there were only five persons in the village who could read and write; today nearly the whole of the population is literate. The collective farmers subscribe to 500 newspapers. There is a library of 2,000 books on the farm.

Finally there is one thing that would have been inconceivable in the village not only of previously backward, colonial Georgia, but also in the village of any other part of pre-revolutionary Russia: this collective farm has built a rest home for 100 persons in a salubrious spot in the mountains. Every comfort, even to the extent of the appointment of a special chef, has been created in this rest-home for the accommodation of collective-farm peasants who go there to spend their vacation after the agricultural year's work is completed.

South of the Kolkhida lowlands, in the corner between the Black Sea and the frontier with Turkey, is situated the Ajarian ASSR, forming part of the Georgian SSR. This autonomous republic occupies an area of 1,085 sq. mi. Its main population consists of Ajarians, a Georgian people, but includes also Russians, Greeks and other nationalities.

The littoral part of Ajaria is more developed economically and is similar to Colchis both in its climate and agriculture: It is a region of sub-tropical crops. Here, in the Chakva District, are the best tea plantations in the USSR and the most important tea factories. Livestock-raising and tobacco-growing are developed in the less inhabited mountainous parts of the republic. A hydro-electric power station has been built in the gorge of the Ajaris-Tsakhali River.

The chief city of Ajaria is Batumi, a busy port through which two-thirds of the oil exports of the USSR pass. The oil comes here from Baku by rail and by pipe-line. There are several oil refineries, an engineering works manufacturing equipment for the tea indus-

try, and a combinat for working up citrus fruits is also under construction.

North of the Colchis lowlands and partly including them, and along the Black Sea coast, is situated the Abkhazian ASSR, forming part of the Georgian SSR. Abkhazians, Georgians, Armenians, Greeks, Russians and other nationalities live in this autonomous republic which occupies an area of 3,400 sq. mi.

The littoral part of the republic, well protected by the mountains, is, like Ajaria, occupied by sub-tropical plantations. Somewhat higher are situated extensive tobacco plantations. Abkhazian tobacco is the best in the USSR. Still higher, on the slopes of the Main Caucasian Range, are forests and a timber industry.

The timber of the dense Abkhazian forests is distinguished for its high quality: the fir-tree, for example, is used for musical instruments, the box-tree for machine parts (ball-bearings, shuttles, etc.). The Abkhazian chestnut tree is also of exceptional strength. It was this tree that provided the beams of Rheims Cathedral in France, built more than 500 years ago.

Besides the industry working on local vegetable raw material (tobacco, wood-working and so on) heavy industry in the form of the new Tkvarcheli coal-mines has now appeared in Abkhazia (in the mountains northeast of Ochenchiri) which are of importance for the whole of the Western Transcaucasus. Working on Tkvarcheli coal, the first section of a large electric power station has recently been started. When this station has been combined with the general power grid of Georgia, the total capacity of the Tkvarcheli station will be 100,000 kilowatts.

There are many health resorts in Abkhazia. There are 42 sanatoria and rest-homes here, the best of which have been built in Soviet times. In this republic is situated the warmest spot in the Western Transcaucasus: the health resort of Gagry, which has the same average annual temperature (59.2° F.) as Nice. In Gagry, however, the summer is hotter and the winter colder than in Nice.

The Black Sea railway, which from the south has already reached Sukhumi, is now being laid along the entire sea coast. This line will be of the utmost importance not only for Abkhazia but also because it will provide the whole of the Transcaucasus with a

second railway outlet to the central districts of the USSR besides the existing outlet along the Caspian coast.

The capital of the Abkhazian ASSR is the city of Sukhumi which lies on the slopes of the mountains around the sea bay. In this city are situated the Institute of Abkhazian Culture, the Institute of Sub-Tropical Farms, a monkey nursery which is of great scientific importance, tobacco factories, and a theatre with Abkhazian, Georgian, Russian and Greek repertory.

The plants in Sukhumi are in bloom all winter. In the suburbs of the city, violets and veronica blossom in December, nut trees in January, apricots at the end of February, and almond trees at the beginning of March. Before the end of winter, golden mimosa from Sukhumi is sold on the streets of Moscow. Fan-palms, magnolia, camellia, bananas, yucca, agave, and oleander grow in the gardens and on the boulevards of Sukhumi.

Above on the mountain peaks, eternal snow; below, by the sea shore, eternal green.

THE ARMENIAN SOVIET SOCIALIST REPUBLIC

The railway runs southward from Tbilisi to the Armenian SSR. The train immediately begins the steep climb from the Kura valley to the lofty Armenian highlands and no less than 3,280 feet have to be ascended within a distance of approximately fifty miles. The track takes a steep winding course through the Lori Gorge, one of the most beautiful ravines in the Caucasus, passing along ledges, over bridges and through numerous small tunnels. Relics of the distant past are to be seen everywhere in these mountains: fortresses, monasteries of the 10th-12th centuries, ruins of medieval towns, caves and bridges. Ancient temples display the peculiar features of Armenian architecture: massive walls of polished slabs, the absence of a prominent apsidal end and of bas-reliefs, small windows, and the pointed cone of a stone cupola on the drum.

At the bottom of Lori Gorge lies the town of Alaverdi, with many new tufa and basalt buildings. Copper used to be smelted here even before the October Revolution, and this industry has since been greatly expanded.

The ascent continues after Alaverdi. Not far from the station of Kalagheran, in the narrow gorge of the river Dzorget, a high-pressure (415 feet) hydro-electric power station, "Dzorages," with a capacity of 22,500 kilowatts has been erected during the Soviet period. Still higher, in the town of Kirovakan (formerly Karaklis), a chemical plant has been built.

The railway mounts to the Armenian highlands and typical Armenian landscape lies before one: dry air, a clear sky, a scorching sun, bare mountain ridges surrounding a flat hollow, here covered with fertile volcanic soil and over-grown with grass, there strewn with rubble. Part of the land has been tilled, part is used as pasture. High-voltage transmission lines are fastened to iron poles.

The Armenian Soviet Socialist Republic (11,580 sq. mi.) lies to the south of the central part of the Transcaucasus and borders on Turkey and Iran. This is a highland region with a number of plateaus and hollows surrounded on all sides by mountain chains. The lowest parts of the valley of the river Arax, which flows to the east along the southern frontier of Armenia, lie over 2,970 feet above sea level; the average height of the plateaus is 4,925 feet, while in places they rise to 8,200 feet.

The great height above sea level lowers the temperature while the barrier of mountains obstructs the wet winds. The climate of Armenia is therefore continental and dry. On the plateaus the average temperature of the warmest month varies between 59° F. and 66.2° F., i.e. it is considerably lower than in the other more densely populated regions of the Transcaucasus. The winter is frosty, the average temperature of the coldest month varying between 5° F. and — 0.4° F. Annual precipitations fluctuate between 16 in. and 24 in. The soils—both brown and black—of the plateaus are fertile. Forests are few in Armenia.

In the lower-lying tracts of Armenia, those in the Arax valley, cotton is grown by irrigation; vineyard raising and horticulture are carried on. On the higher levels of the rest of the territory, the chief occupation is cattle-breeding on the mountain pastures; grain cultivation in these mountainous regions is of importance only for consumption.

Industry is developing: food and condiments (fruit-canning, wine-making, etc.), textiles, chemicals, and mining (copper production and the extraction of building materials). And Soviet Armenia supplies the other republics of the USSR with copper, cotton, tufa, pumice, wines, wool, and leather.

The Republic is inhabited by over one million persons, the national composition of the population being far more homogeneous than that of the other republics of the Transcaucasus. Approximately 85% of the inhabitants are Armenians. Nearly a million Armenians live in the USSR outside Armenia, mainly in Georgia, Azerbaijan, and in the North Caucasus, for the most part in the towns. Part of the population of the Armenian SSR is composed of Russians, Azerbaijanians, Kurds, and others.

In the past Armenia was a land of terrible historic crises. The history of its people—an industrious people with an ancient and deep culture—makes tragic reading. The Armenians were compelled to fight for their national independence against numerous powerful invaders—Assyrians, Arabs, Mongolians, Iranians, and others—and suffered grievously in the fierce, and often unequal, struggle. Their towns were razed to the ground, the inhabitants were wiped out, or led away as captives; but the spirit of the people was strong, and its culture was reborn, attaining the loftiest heights in literature and architecture, in folk poetry and music. Unfortunately, the story of the slaughter en masse of this people does not only relate to the terrible Middle Ages. Only a little more than a score of years ago, several hundred thousand Armenians were massacred within the borders of Turkish Armenia, the titled initiators of this massacre cynically calling it “the regulation of the Armenian question.”

History demanded many sacrifices of the Armenian people, of which the bitterest sacrifice was the loss by the mother country of millions who were forced to leave Armenia and settle in the central regions of Russia or to go abroad—especially to France and the United States.

The October Revolution, which proclaimed the equality of all peoples and their right to self-determination, led to the formation in the Soviet Transcaucasus of the Armenian Soviet Socialist Re-

public—one of the eleven Socialist Soviet Republics voluntarily entering the Soviet Union. The Armenian Soviet Republic enjoys equal rights and works in close conjunction with the other ten powerful republics; its state language is the Armenian language; it knows no national oppression. This alone would have sufficed to erase the whole dreadful past, but more than that has been won. The right to a new life is actually guaranteed by the flourishing state of its economy and culture.

Figures bear witness to the prosperity of Soviet Armenia. Within the period of 1913-1937 the industrial output of the Armenian SSR increased fourteenfold. In 1919 the capacity of its electric stations was 1,500 kilowatts; in 1937 it was over 70,000 kilowatts.

From 1913-1937 the proportion of industrial production in the total output of national economy rose from 21.7 per cent to 71.6 per cent, this rise, it should be noted, being accompanied by the absolute increase of agricultural produce.

In 1919 each Armenian village possessed on the average 32 primitive wooden plows, 8 modern plows, 43 scythes, and 25 sickles. In 1938 the machine and tractor stations, State farms and collective farms possessed 1,389 tractors and 185 harvester combines. Seventy per cent of all agricultural work is done by machinery.

In 1919 the area under crop was 203,000 acres; in 1937 it was 1,079,000 acres. In Armenia there are several score millionaire collective farms, i.e. farms which have an annual income of a million rubles and over. Collectivization in 1937 was equal to 90%.

Within the period 1914/5-1936/7 the number of secondary school children increased sixty-eight times. More than ten times as many books are now being published in the Armenian language as before the Revolution. The complete works of the Armenian classics—Abovyan, Nalbandyan, Proshyan, and others—are issued in Armenia, as are the works of the classics of Russian and world literature—Leo Tolstoy, Aeschylus, Goethe, Balzac, and so on.

In Armenia today there are 17 theatres (13 Armenian, 2 Russian, 1 Azerbaijan, and 1 Kurd); in 1914 there was not a single theatre. In 1939, the theatres are presenting modern and classical plays both by Armenian and by Russian dramatists. The Republic has fifteen scientific research institutes, eight universities, and fifty-four

technical schools. Nothing of the sort existed in pre-revolutionary Armenia.

The railway from Tbilisi which runs across the Armenian highlands passes them from north to south. The train tunnels through the Jajur Pass (about 6,560 ft.) of the Pamb Range and emerges on the Leninakan Plateau, whose average height is 5,020 ft.

The even surface of the Leninakan Plateau is covered with black and red volcanic tufa, as well as by trakhit and basalt lava, discharged by the volcanos surrounding the plateau. The soil is fertile here, but there is insufficient moisture. Within the Soviet period the Shirak Canal (14 miles long), leading from the River Arpachai, has been constructed for the purpose of irrigating the fields of the collective farms, including the area under sugar beet, which is a new crop for this region.

On the plateau stands the town of Leninakan (formerly Alexandropol), the second largest town of Armenia. It has become an important industrial center in the Soviet years. A cotton factory (the first in Armenia) with 41,000 spindles has been erected here, and construction is nearing completion on a second section of the combine with 70,000 spindles. A large meat combinat and several factories have been built, and a hydro-electric power station has been erected near the town on the river Arpachai.

From Leninakan the railway first runs along the Arpachai and then along the Arax, both rivers serving as the frontier-line between the USSR and Turkey. The huge snow-clad cones of extinct volcanos tower on either side above the grey arid plain, as the train passes between them.

On the left stands Mount Alaghez, the highest peak (13,435 ft.) of the Little Caucasus within the borders of the USSR. A meteorological station, functioning the whole year round, has been erected on its summit.

On the right, on the other side of the frontier river Arax, towers Mount Ararat (16,917 ft.), a majestic peak which in summer is snow-capped for nearly a mile below its summit. The view of Mount Ararat, reigning over the whole valley of the Arax, is unforgettable. The impression is the more striking because Mount

Ararat, together with Little Ararat (12,841 ft.), its satellite, stands alone on the level plain.

At the foot of Mt. Alaghez exploitation is proceeding, on a large industrial scale, of the deposits of tufa (in Artika) and pumice (in Ani). The extraction of building materials is an industry of importance for the whole of the Soviet Union. For example, the handsome edifice of the "Dnieproges" hydro-electric station in the Ukraine was built of Armenian pink tufa, and Armenian onyx was used to face the Soviet Pavilion at the 1939 World's Fair in New York.

The railway, skirting around Mt. Alaghez from the southwest, enters the Erevan Valley. This is the most densely populated and the most highly cultivated region of the Armenian SSR. Closed in on all sides by high mountains, the valley has a sharply continental climate with scant precipitation, a comparatively cold winter, and a very hot summer. In Erevan (3,200 ft. above sea level; 40° 16' N., 40° 35' E.) the average temperature for July is 77° F., the average temperature for January is 21.5° F., and annual precipitation amounts to 12.6 in. The tracts which are not irrigated are desert-like in character.

During the years of Soviet rule a great network of new irrigation canals has been created in the Erevan Valley, and the irrigated area is continually extending. In 1914 there were 240,000 acres of irrigated land; in 1937 there were 412,700 acres. Cotton plantations and vineyards have arisen on the irrigated lands and horticulture has been developed.

Agriculture is conducted on modern lines: for example, in 1938 the cotton was sown by means of complex seeding-machines over a greater part of the sowing area, which was subjected to threefold tillage by means of tractors. Over 74,500 acres of grain were reaped by harvester combines. For the yield of its cotton the Armenian SSR takes a foremost place in the USSR.

The direct result of the modernization of agriculture and the increase of its productivity, is the increased prosperity of the collective farmers. For example, in 1937, 260 collective farmers of the Artashat Collective farm in the Kamarlin District built new homes, furnished them with new furniture, and installed electricity. The

Armenian village is being transformed on a mass scale and is acquiring a new aspect, quite unlike the aspect of the old Armenian village with its pressed clay cabins and semi-mud huts.

A collective farm which becomes a millionaire farm stands on an equal footing with every other collective farm: the rate of increase of the wealth of collective farmers depends entirely on the farmers themselves; on their organizational experience, and their labor discipline. The state on its part has done everything: it has given the collective farms land, water, machines, and skilled agricultural experts.

A few stops before Erevan the train arrives at Echmiadzin station. In this district is situated the famous Echmiadzin Monastery, founded over fifteen hundred years ago and since 1441 Echmiadzin had been the residence of the Catholikos, the Patriarch of the Armenians.

In Echmiadzin stands a temple with an underground well surrounded by walls and built in the Armenian style of architecture. This is probably the most ancient building to be preserved on the territory of the USSR, in a "living" state, that is, not in ruins. It was erected in the 4th-5th centuries. Historical relics of the Armenians are kept in the temple.

Echmiadzin is a State Museum of Antiquities. It contains the most extensive collection of ancient Armenian manuscripts in the world, numbering 8,000, and 80,000 printed books. The treasure-house of the Museum and the library have been enriched with new objects during the Soviet years. Scientific research is carried on here.

Erevan, the capital of the Armenian SSR, lies for the most part in a hollow enclosed on the northwest and northeast by mountains, and along irrigation canals leading out of the river Zanga, a tributary of the Arax. The summer here is sultry and the winter, in comparison with the rest of Transcaucasia, rigorous; it is hot at midday and cold at night. To the south, beyond the Turkish frontier, rises snow-clad Mt. Ararat. It stands 37 miles away, but viewed from the streets of Erevan, it seems to overhang the city.

People lived on the site of Erevan in the Bronze Age. The town was founded probably in the first half of the 7th century, and grew on account of its position at the intersection of important caravan

routes. Old Erevan bore an Asiatic character—narrow streets, flat roofs, clay hovels. Nicholas I called Erevan "the clay pot," a designation as apt as it was contemptuous. Not a single ancient town of the Transcaucasus has changed to such an extent within recent years as Erevan.

Today Erevan is being transformed in accordance with the designs of the late A. I. Tamanyan, a prominent Armenian architect. Many new districts have sprung up. The huge Government House and the new Theatre of Opera and Ballet, one of the largest and handsomest theatres in the USSR, just nearing completion, were both designed by Tamanyan. Water has been brought to the town, and modern sanitation introduced, trolley lines laid, and many motor-cars may be seen in the streets in the city.

It is not only the outward aspect of the capital which has been transformed; its development has been provided with a solid economic base. Pre-revolutionary Erevan was known only for its cognac factory (employing a hundred workers). Today in Erevan there is a carbide plant, clothing, boot-and-shoe, and silk-winding factories, a meat combinat, a milling combinat, and numerous other enterprises. Construction on a huge plant for the production of synthetic rubber is nearing completion using limestone as a chief raw material.

In 1914 the population of Erevan consisted of 29,000 persons—in 1937 of 150,000.

This is the center of Armenian culture. Here (as in the capitals of the other republics of the Transcaucasus), a branch of the Academy of Sciences of the USSR carries on scientific work. A Tropical Institute has been created whose work has resulted in a great decrease in the number of malaria cases in Armenia. There are a number of higher educational establishments—a conservatory of music, and industrial, pedagogical, agricultural, medical and other institutes. In Erevan, as in all Armenia, there was not a single scientific institute before the Revolution.

There are many new settlements in the suburbs of Erevan formed by Armenian emigrants who returned to their homeland from other countries after the October Revolution.

Livestock-raising and cheese-making have been developed in the

mountains lying to the north, east, and southeast of Erevan. This is as yet the least developed part of the republic as regards transport facilities, but even here new industrial centers are developing. For example, in the extreme southeast, the new town of Kafan, having an important copper-smelting industry, has sprung up, based on the Zangezur copper deposits; copper-smelting before the Revolution was quite insignificant here. Within the last twelve years the population of the town increased fivefold. Till quite recently only camel caravans could penetrate into the Zangezur region. Now a railway runs to Kafan (from Azerbaijan).

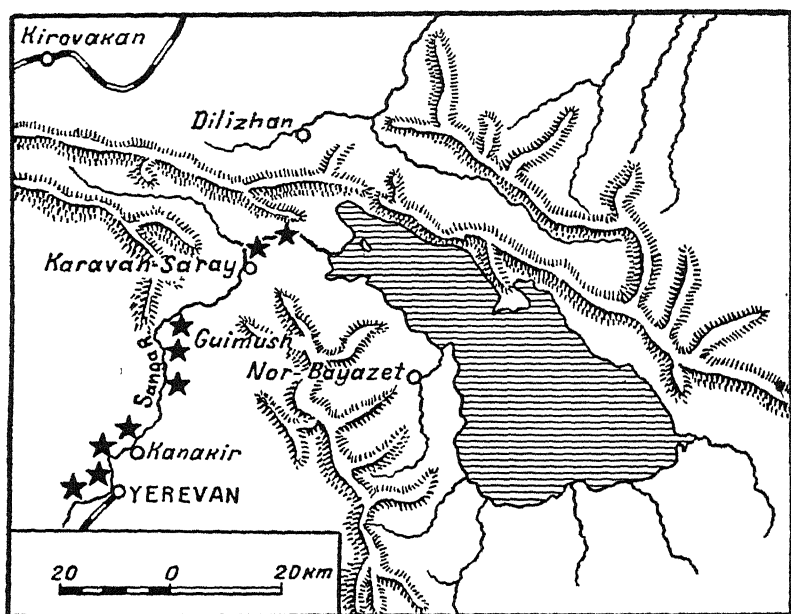
The growing economy of Armenia requires more and more electric power. Several hydro-electric stations have already been built and have given rise to various industries requiring a large amount of electricity; but this is only the initial stage of the exploitation of the immense resources of hydro-energy possessed by Armenia. Water-power is of especial importance since there are no large deposits of mineral fuel in the republic.

A motor road runs northwards from Erevan, ascending the gorge of the river Zanga and leading to Lake Sevan (the Azerbaijan name is Gokcha), which is 37 miles distant. Sevan is one of the largest high mountain lakes in the world. Its pale blue waters, the color of the sea, are enclosed by harsh mountainous shores. It lies 6,286 feet above sea level, and the area of its mirror-like surface is 545 sq. mi.—about two-and-a-half times that of the Lake of Geneva. The summits of some of the mountains surrounding the lake reach a height of over 11,800 feet above sea level.

Sevan yields 1,000 metric tons of trout annually. Health resorts have been created on the shores of the lake, which consists of two parts connected by a strait: one of the parts is large, but shallow; the other is smaller, but deeper. About thirty small rivers and streams flow into Sevan, but the river Zanga alone flows out of it. The Zanga, which flows into the Arax, descends 3,281 feet over a distance of sixty miles.

Armenia requires power and water for irrigation, while Sevan evaporates 327,600 million gallons of water annually, immeasurably more than the amount taken by the Zanga. At the present time exploitation has begun of the vast water resources of Sevan. Accord-

ing to existing plans, part of the water of Sevan will be transferred by means of pumping stations to the bed of the Zanga. Along the sixty mile descent a cascade of nine hydro-electric stations, with a total capacity of half a million kilowatts, will be constructed (see map 22, below). The water will irrigate 247,000 acres of barren land in the Arax valley which will be used for the cultivation of cotton and grapes.



MAP 22—HOW THE WATER OF LAKE SEVAN IS USED

In the course of fifty years the level of the lake will sink 165 feet, after which only the additional water will be let out. The surface will diminish, and, consequently, evaporation, and the water balance of the lake will be brought into equilibrium.

The larger shallow part of the lake will disappear, while a great part of the small deep part will remain. The scenery of the most picturesque places on the Sevan coast will not be altered.

The first hydro-electric station of the Sevan Cascade has already

been constructed: this is the "Kanakirges" Station (in 1939 its capacity will total 88,000 kwts.). The second, and largest, of the hydro-stations of the Cascade—"Giumushges," with a capacity of 144,000 kwts.—is in the course of construction.

The exploitation of the immense potential resources of Lake Sevan will turn the industry of Armenia into branches especially requiring large quantities of electricity; and since the growth of the republic will then proceed on a vast scale, its whole character will be entirely transformed.

The Kazakh Soviet Socialist Republic

THE Kazakh Soviet Socialist Republic occupies a vast territory from the Lower Volga in the west to the Altai Mountains in the east, from the Trans-Siberian Railway in the north to the Tien-Shan Mountains in the south. The area of the republic is 1,059,700 sq. mi., approximately equal to the area of Western Europe, without its peninsulas. Kazakhstan is six times as large as the Ukraine, but its population is only one-fifth as large. Because of its size, Kazakhstan is divided into eleven regions.*

This huge territory is marked by a great diversity of natural conditions; nevertheless, a dry treeless plain is the characteristic feature of its scenery. In the spring the plain is covered with bright green grass and an abundance of flowers; in summer the green carpet is scorched by the sun and turns grey. Its few rivers flow for the most part into salt lakes, whose shores are grown over with tall reeds.

The north of Kazakhstan is occupied by steppe land; in the south are semi-deserts and deserts. In addition to the vast tracts of pasture lands, there are very valuable arable lands, black soils in the extreme north and grey soils in the extreme south.

In the center of Kazakhstan is a great highland district, which in the southeast and east touches on the mountain ranges of Tien-Shan and Altai, whose slopes are overgrown with conifer forests.

The climate is continental and dry, the average July temperature varying between 77° F. in the north and 84.2° F. in the south, while the average temperature for January varies between — 4° F. in the

* The West Kazakhstan, Gourev, Aktiubinsk, Kzil-Ordinsk, Kustanai, North Kazakhstan, Karaganda, South Kazakhstan, Pavlodar, East Kazakhstan, and Alma-Ata Regions.

north to 26.6° F. in the south. By the Sea of Aral the annual precipitation amounts to less than 4 in. More than 12 inches fall only in the borderlands of Kazakhstan in the north, northeast, and southeast. Dry Kazakhstan has much in common with the mountainous states of the U.S.A. North Kazakhstan resembles Idaho, Montana, Wyoming, Utah, and Nevada, while South Kazakhstan resembles Colorado, New Mexico, and Arizona, the principal difference being that Kazakhstan on the whole lies somewhat lower in relation to sea level than the American states. The analogy is not limited to climate and vegetation, but extends farther; both in Kazakhstan and in the above-mentioned part of the U.S.A. stock-raising and the extraction of non-ferrous metals have been developed.

The population of the Kazakh SSR is close to seven million. The majority of the inhabitants are Kazakhs, a Turkic people formerly engaged almost entirely in nomadic cattle-breeding. In addition to the Kazakhs, there are Russians, Ukrainians and Uzbeks.

This Republic is exceptionally rich in minerals; its depths contain over half the deposits of copper, lead and zinc in the whole of the Soviet Union, nearly a third of the deposits of oil, and a large quantity of coal, gold, potassium, phosphorites, and others. But in the past, when Kazakhstan was a colony, all this wealth remained almost untouched, due mainly to the roadless state of the country: two railways passed through the edges of Kazakhstan only and the vast territory was crossed merely by camel caravans. The principal branch of economy was cattle-raising on the pastures of the country, and the cattle made the journey to the markets outside Kazakhstan on foot.

During Soviet years the economy of Kazakhstan has skipped over several centuries. About 3,000 miles of railways have been laid, forming the base of the transportation system. During the period 1913-1937, railway freight turnover increased from 1,280,000 tons to 22,200,000 tons, nearly eighteenfold. Motor roads are a temporary substitute for railways in some places.

Industrial enterprises have been established, or are under construction, in the localities with important mineral deposits. Kazakhstan is becoming one of the most important bases of non-ferrous metallurgy; for example, in 1937 it supplied 75% of the lead ex-

tracted in the USSR. In the future Kazakhstan will take first place in the USSR for copper output.

During the Soviet years, gross output of industry in Kazakhstan has increased more than twelvefold. During the period of the Second Five Year Plan the output of oil nearly doubled, that of coal increased more than fivefold, that of lead increased twelvefold.

Together with grain cultivation, which is carried on mainly in the north, the cultivation of technical crops (raw material for industries) has developed in Kazakhstan. There are large tracts in the south under cotton, sugar beet (a new crop for Kazakhstan), and other industrial crops and heavy yields are obtained from these plantations. For example, in some of the best collective farms, as much as 115,700 lbs. of sugar beet per acre were obtained in 1938, the average yield in the republic being 26,400 lbs. per acre.

Ninety-seven and three-tenths per cent of the peasant households in Kazakhstan have united in collective farms; 24,000 tractors and 8,000 harvester combines are at work in the fields. The overwhelming majority of the Kazakhs have abandoned their nomadic life and settled down. Every region in Kazakhstan is today engaged in agriculture, and there no longer remain any purely cattle-raising sections without any land under crops.

Kazakhstan is one of the most important livestock-producing regions of the USSR and many large scale cattle-breeding farms have come into existence. The triumph of collectivization was followed by a rapid increase in the number of cattle. Within the last four years the total number of cattle has more than doubled, while the number of cattle in the private possession of collective farmers has increased fourfold. Steps are being taken to improve the quality of the cattle and in 1936 alone the collective farms received 28,000 pedigree animals for the purpose of hybridization.

The economic growth of the country was accompanied by a growth of Kazakh national culture. Compulsory universal elementary education has been introduced. During the period of the Second Five Year Plan the number of secondary school children increased 9.3 times. Seventeen universities have been founded; 13 periodicals, about 170 newspapers, and millions of books are published.

The everyday life of the people of Kazakhstan has changed entirely. Twenty years ago it had much in common with life in the days of Ghengis Khan: the Kazakh moved his tent about from place to place on the hump of a camel, spent all his life in the saddle, ate with his hands. Today a modern Kazakh collective farm is to be found in the "kolhoz"—Chubarchi in the Kokpektin District. There are 158 peasant households in this collective farm. Within four years the number of sheep and goats has increased more than twofold, horses over threefold, camels fivefold. The collective farm has at its disposal motor trucks, a tractor, and a combination thresher. Sheep-shearing has been mechanized. There is a club with a membership of 250 persons, a seven-year school, and a radio transmitter has been built. The houses are furnished with modern European furniture.

* * *

The railway which runs from Moscow in a southeasterly direction crosses the River Ural, the dividing line between Europe and Asia, at the town of Chkalov (formerly Orenburg), and soon enters the republic Kazakhstan.

One's first impression is of the extraordinary industrial rebirth of this steppe land region. Near Aktiubinsk, a dusty town with white mud-huts, a huge chemical plant producing phosphoric fertilizers has been erected. It is an example of modern up-to-date technique. Near the plant a garden with leafy trees has been laid out, a green patch against a background of grey steppe overgrown with wormwood.

The railway line penetrates deep into Kazakhstan, passing through a boundless plain. Beyond Aktiubinsk a recently constructed branch line, 321 miles in length, leaves the main track. It serves to connect the principal network of railways with a great oil field lying in the west of Kazakhstan along the River Emba on the coast of the Caspian Sea. Oil-bearing salt cupolas, of which there are several hundred, lie scattered over an even tract of land at a distance of fifteen to eighteen miles from each other. The geological deposits of the Emba are very great: over 1,000 million metric tons of oil. Exploitation is proceeding in several localities

(Dossor, Makat, Koschaghil, Iskin, and others) and there are gushers as well. The greater part of the oil is passed through a new pipe-line, 434 miles long, to the town of Orsk in the Southern Urals, where it is refined. The oil fields will be provided with water by means of an aqueduct whose total length—400 miles—will exceed that of the longest aqueduct in the world, in Los Angeles.

In addition to oil, Western Kazakhstan is rich in other mineral raw materials. Borax deposits were discovered in 1934 near Lake Inder on the lower reaches of the River Ural, and are now being exploited. Large deposits of potassium were discovered recently in Western Kazakhstan. Immense deposits of chromo-nickel have been found in the Aktiubinsk district.

The railway which runs from Moscow through Aktiubinsk into the interior of Kazakhstan passes over a low mountain range—the Mougojar Heights (the southernmost part of the Urals, up to 2142 feet)—and approaches the Sea of Aral. This is a great salt lake (24,870 sq. mi.), situated in a desert. Its greenish-blue surface shows beyond the yellow streak of sand at its shore. A regular steamship line on the Sea of Aral connects the railway with the mouth of the River Amu-Darya—a fishing region to the south of the lake.

The train continues its journey in a southeasterly direction up the River Syr-Darya, crossing the Turan desert lowlands. This is a plain covered with a coarse sparse grass, and here and there salt marshes and sand dunes. Kitchen gardens are laid out near the stations, with the beds dug out, not piled up, on account of drought. Side by side with the clay houses of the Kazakh settlements stand felt tents, their summer dwellings, and nearby are herds of sheep and camels. The summer heat is intense—the thermometer in the railway carriage registering 113° F. At times the horizon is seen to rise through the quivering air and a mirage appears—a bright picture of a non-existent lake.

After three days' journey through Kazakhstan, mountains rise in the south, the first spurs of the Tien-Shan. The train turns to the east and runs parallel to the southern borders of Kazakhstan, at the foot of the snow-clad mountain range, Kirghiz Ala-Tau.

A light breeze blows from the mountains. The railway track

passes over irrigation canals; rapid mountain streams approach the rails and suddenly disappear underground, gushing out on the other side of the track. The chief crop cultivated here is cotton, and there are many vineyards.

The principal town in this part of Southern Kazakhstan is Chimkent. A lead works has been erected here whose capacity is greater than any similar works in Europe. Chimkent also possesses a unique enterprise: the only factory in the world manufacturing *santonin* (a medicine) from *santonica* wormwood.

Not far from Chimkent lies the town of Jambul (formerly Aulieh Ata). This town has been so called after Jambul, the most popular national poet and singer of Kazakhstan, who is now ninety-three years old. Within recent years this town has become a center of the sugar industry, developed on the produce of the new sugar beet fields here. A few years ago phosphorite deposits, remarkable for their high phosphorus content, amounting to 250 million metric tons were discovered in the mountains of Kara-Tau to the north of the town. The manufacture of fertilizers will be developed here for the fields of Kazakhstan and Central Asia.

The railway which runs from the southern regions of Kazakhstan in a northeasterly direction towards Siberia is known as the Turksib Railway (Turkestan-Siberia). This line, nearly 930 miles long, was constructed in 1930 with the main purpose of supplying the cotton-growing regions of Central Asia with the grain of Siberia, thereby freeing the irrigated sowing areas, which are suitable for the cultivation of cotton, from dependence on grain growing. At the same time the Turksib has infused new life into a vast tract of land in Eastern Kazakhstan, from Tien-Shan in the south to the Altai Mountains in the north.

Leaving the Jambul district, the Turksib passes over a low and bare mountain range and enters Semirechye, a region bordered in the north by Lake Balkhash and in the south by the outer heights of the Tien-Shan Range.

Semirechye is most densely populated in the region of foot-hills, where the soil is irrigated by the mountain rivers. This is a fertile land of wheat, orchards, and honey. Recent years have wrought changes in the agricultural specialization of Semirechye; in addition

to wheat, industrial crops are now being cultivated as well: cotton, sugar beet, and others. This denotes the further development of industry; sugar-refining is already being carried on, and cotton manufactures will soon come into existence.

In Semirechye at the foot of the northern slope of the Ala-Tau range, and between two streams flowing down the mountainsides of the Great and Little Almatinsk, is situated the capital of Kazakhstan—Alma-Ata (former Vernii, $43^{\circ} 16' N.$, $76^{\circ} 59' E.$)—one of the most beautiful cities of the USSR. The town lies on a height formed of the precipitations deposited by the two streams and stands somewhat apart from the mountain range in the steppe-land spread out before it. Just above the town, like scenic drops, rise snow-clad summits whose lower slopes are covered with shapely fir forests. The town itself lies in the midst of apple orchards. Alma-Ata, in the Kazakh language, means "Father of Apples." Four rows of mighty poplars line the straight asphalted avenues and rippling brooks rush through each of the avenues of the town from the mountains, disappearing without a trace in the boundless dry steppe.

In Alma-Ata there are fruit-canning, boot and shoe, cloth, and flour-milling industries, and such institutions of the Kazakh's new culture as theatres, a philharmonic society, medical, pedagogical, agricultural, and other institutes, a branch of the Academy of Sciences of the USSR, and so on. Alma-Ata lies in the zone of frequent earthquakes and therefore the architectural design of its new stone buildings is that of all anti-seismic construction.

From Alma-Ata the Turksib turns to the north. After crossing the River Ili and passing by the eastern shores of Lake Balkhash (7,225 sq. mi.), it runs towards Siberia through a semi-desert region, on which at intervals appear the buildings of large state cattle-breeding farms and garages along new motor roads.

Before passing beyond the boundaries of Kazakhstan, the Turksib crosses the River Irtysh, a left tributary of the Ob. At the confluence of these two rivers stands the town of Semipalatinsk. A huge meat packing plant has been erected near the town.

To the east and southeast of Semipalatinsk, higher up the Irtysh, lies the so-called mineral-ore Altai region, which is rich in lead, zinc, silver, gold, copper, and a number of rare elements (cadmium,

galium, germanium, etc.). This is one of the richest poly-metal regions in the world. Nearly half the lead and zinc deposits of the USSR are to be found here.

The exploitation of the deposits of the Altai mineral-ore region, especially of its best-known bed, called "Ridder," had begun before the Revolution with the aid of foreign capital; but the work began to be done on a really large scale when the region passed into the hands of Soviet industry. During the Soviet years approximately 150 million rubles were invested in the development of Ridder alone. A new ore-separator plant was erected, the lead factory was thoroughly reconstructed, a hydro-electric station was erected on the River Ulba, a town was established, and a railway line, about 205 miles in length, was built to connect this mining district with the general transport system. A large hydro-electric station will be constructed on the Irtysh in the course of the Third Five Year Plan. The industrial development of other districts of mineral-ore Altai besides Ridder has also been proceeding.

In the north the Trans-Siberian trunk line, which runs from east to west, passes through the territory of Kazakhstan for a short distance in the Petropavlovsk district, a fairly densely populated forest steppe district producing wheat and butter.

The whole interior of Kazakhstan had been entirely roadless. After the Revolution a railway from Petropavlovsk began to make its way here, but at first it went only so far as the health resort of Borovoye, a sort of island of lakes and pine-covered rocks in a dry steppe. Then the line was extended through Kokchetav to Karaganda, a basin of coke-forming coal, whose deposits amount to 53 billion metric tons, lying in the center of Kazakhstan. Before the Revolution there was only one small pit here; today Karaganda has become the third largest coal center of the USSR (after Donbas and Kuzbas). In 1938, about 4,150,000 metric tons were extracted here. Mining construction is proceeding at a rapid pace, and the work in the mines has been entirely mechanized. Karaganda coal is brought to Magnitogorsk in the Southern Urals via Petropavlovsk.

A few years ago the railway was extended from Karaganda still further south, right to the shores of Lake Balkhash. Here, in a semi-desert region, by the Kounrad deposits (approximately 2,500,000

metric tons of metal) a huge copper plant has been erected. A branch line, 256 miles in length, runs from the Karaganda Balkhash trunk line in a westerly direction to the Jezhazgan district, situated right in the heart of Kazakhstan. Immense deposits of copper—3,700,000 metric tons—lie here, but are utilized only by the small Korsakpai copper works. It has been planned to build a huge plant to be known as the Jezhazgan copper plant, not far away. The design of the combine has already been drawn up.

According to railway construction plans for Kazakhstan, one road, Akmolinsk-Kartali, will cross North Kazakhstan from east to west and will straighten out the connection between Magnitogorsk and Karaganda (this railway is already under construction), and the other will continue the vertical line from Petropavlovsk to Balkhash (over 745 miles) in a southerly direction to the Turksib, thus connecting Karaganda with Alma-Ata, the capital of the republic.

The Union Republics of Central Asia

IN the heart of the continent of Asia, cut off from all outlet to the ocean, is a land of great individuality and unusual history, where battle with the desert has played an important part. This is Soviet Central Asia, bordering on Iran, Afghanistan, and the western province of China, Sin-Kiang.

Irrigation canals, thousands of years old, are still to be seen here. The chipped and broken walls of ancient world-famous towns, dead long ago, rise above the sea of sand. Iranians, Greeks, Arabs, and Mongols used to clash here. This land was once the domain of Cyrus. The Lake Iskander has borne that name since the days of Alexander the Great. The religious schools of the city of Bokhara, in the period of Caliphate educated learned men for the whole of the Mussulman East; and Samarkand was the brilliant capital of the empire of Tamerlane, which included distant Moscow within its borders.

Repeatedly invasions swept away the established culture of the land, and it was born again. Constantly the oasis battled with the desert. Such was the ancient history of this country. In the 19th century Central Asia* became the cotton colony of tsarism. Thus it entered into the system of capitalist economy, an Asiatic despotism under the heel of world market prices, slave manual labor in the power of the mill-owners of the metropolis, the submersion of a highly developed handicraft culture in a flood of cheap manufactured goods, miserable ignorance amid remnants of a fading exotic past.

After the October Revolution everything changed. In this ancient

* We are speaking of that part of Central Asia which today forms part of the USSR. Formerly this region was frequently called Turkestan.

land, where up till yesterday the old men pointed out the town founded by Adam, where water was brought to the fields by creaking wooden wheels carrying earthenware pitchers, where till recently the women were concealed by thick black horsehair veils, now chemical plants are in course of construction to extract nitrogen from the air by means of the electrolysis of water through the current from powerful hydro-electric stations. Record cotton crops of the most advanced collective farmers are seventeen times as heavy as the average yield of former times. There are scores of universities. The air lines in the amount of freight carried very often compare favorably with the air lines of Western Europe.

The country stepped straight from a regime permeated through and through with the survivals of feudalism into socialism. Soviet Central Asia is no longer a colony. It forms part of the Soviet Union as one of the Union Republics, enjoying equal rights with all the others. It participates in the system of the distribution of labor among the regions of the USSR equally with every other region. Large-scale industry has appeared here for the first time. A new technique has been adopted. Immense deposits of minerals have been discovered, thus contradicting the old scientists, who repeated the views of the French geologist Delaunay, that the mineral wealth of Central Asia was insignificant. Whereas formerly only the surface of the earth was exploited in Central Asia—the soil and vegetation—now the depths of the earth are being utilized as well. Agriculture has been socialized and, to a very large extent, mechanized.

It is worthy of remark that in Soviet Central Asia, in a land which in the past was never free from the oppression of one nationality by another, states have been formed based on the nationality of their inhabitants.

In the days of tsardom, national and economic entities in Central Asia were purposely divided in order to make it easier to rule them. The nationalities within themselves were divided by administrative frontiers of general-governorship, different nationalities being purposely linked together to create enmity and hardship among the different peoples.

After the triumph of the October Revolution the people of Soviet Central Asia decided to form national states on its territory to be federated with the Soviet Union. National frontiers were laid down, marking out great national groups so that the new political map of Central Asia repeated the main outlines of the ethnographic map.

Today in Soviet Central Asia there are four Union Soviet Socialist Republics—Uzbek, Turkmenian, Tajik, and Kirghiz—and one Autonomous Republic, that of Kara-Kalpak. The names of the Republics identify the principal peoples inhabiting them.

Before the October Revolution the populations of Central Asia were not only forcibly deprived of their national entities, but even of their correct names. The Kazakhs were called Kirghizians, the Kirghizians were called Karakirghizians, the Uzbeks were called Sarts. The correct national names have now been restored.

But national demarcation under the Soviet system in no wise ran contrary to economic considerations. Economically integral regions were not divided up. For example, each irrigation system was, as a rule, included within the borders of one state. National considerations were supplemented and amended by economic considerations, particularly since on both sides of the new frontiers there was one political regime—the Soviet.

Central Asia consists of two sharply contrasting parts: lofty mountain ranges, the northern border of the great mountain systems of Asia, which tower in the southeast; and adjoining them on the northwest the immense plains of Turan, deserts and dry steppes which equal whole European states in area. Moisture is condensed on the high mountains, where snow and rain fall, but the plains are parched by the scorching sun.

The plains of Central Asia would be barren were they not provided with water by the mountains. Rivers carrying fertile silt flow down the mountain-sides and are utilized for irrigation. Thus oases, full of life and activity, spring up in the deserts.

It is easiest of all to lead the water from the rivers into the fields by means of channels at the foot of the mountains, in the hills where the slope is considerable. It is not necessary to elevate the water here; it runs of its own accord into the main canal and through the fields in a ramified network of small channels. The

most important and thickly populated oases of Central Asia lie in these foot-hills. The greater part of the zone of foot-hills is occupied by the Uzbek SSR, the main region of irrigated agriculture in the USSR. Only one part of the Republic—the Khorezm Region and the Kara-Kalpak Autonomous Soviet Socialist Republic—lies at a great distance from the mountains, on the lower part of the River Amu-Darya.

The Tajik SSR and the Kirghiz SSR are situated mainly in the mountains. Only small parts of their territory descend into the low mountain-valleys, but it is these parts which are most densely populated.

The Turkmenian SSR lies mainly on a plain. There are comparatively low mountains only on the borders of the Republic, but it is also true of the Turkmenian SSR that the greater part of the inhabitants live at the foot of the mountains.

THE UZBEK SOVIET SOCIALIST REPUBLIC

The Uzbek SSR is the first republic of Central Asia in size of population (about 6 million) and economic power. In this land of foot-hills there are more irrigated fields than in all the other republics of Central Asia put together. This Republic produces nearly two-thirds of the cotton of the Soviet Union.

The Uzbek SSR, otherwise Uzbekistan, has an area of 146,000 square miles, which exceeds that of Italy. Three-quarters of the population is composed of Uzbeks, a people of Turkic origin with an admixture of Iranians. They are masters in the art of irrigated agriculture. Besides Uzbeks, there are Kara-Kalpakians (who form an autonomous republic), Russians, Tajiks, Kazakhs, and other peoples, in Uzbekistan.

The railway line which connects Moscow with Central Asia runs in a south-easterly direction, crosses the Volga, and penetrates deep into the boundless dry stretches of Kazakhstan. At a distance of 1860 miles from Moscow, after a long monotonous stretch of brown plains, the blue silhouettes of mountains are seen on the horizon. These are the first spurs of Tien-Shan.

Cracked soil, meagre wormwood, the drab, grey desert, then sud-

denly the desert is cut off as though by a knife. The train rushes into the fresh green vegetation of the oasis.

Here there is water and shade. Rows of poplars and mulberry trees grow by the side of the rippling streams. Solitary karagaches, their dense foliage resembling a ball, stand by the roads, which are covered with a thick layer of soft dust. The fields are sown with cotton and alfalfa. Rice grows on the inundated fields. Vineyards and apricot orchards are glimpsed behind the clay fences. At the stations there are white mountains of cotton.

Carts, whose two wheels are higher than the stature of a man, move slowly along the roads, the drivers sitting astride the horses with their feet resting on the shafts. The men of Uzbekistan wear white clothing open to the waist, exposing their sun-burnt chests, and black skull caps embroidered in white. The women are dressed in brightly colored gowns of radiant pale yellows and reds. The girls' black hair is braided in innumerable thin plaits, old men in colored turbans ride along on donkeys.

Is it the traditional patriarchal Orient? No. The horses are overtaken and passed by one automobile after another, with Uzbeks in the drivers' seats. Cyclists speed along the roadsides. You can no longer see the *omach*, the plow of Biblical times, at work in the fields; now over twenty thousand tractors and nearly fifteen hundred harvester-combines are working in the Republic. Scarcely any individual cotton-growers are seen on the cotton plantations. Large united groups of people and collective-farm brigades work there now, for in the Uzbek SSR 95.5 per cent of the peasant households have united in collective farms. The results of the work are very successful. There are collective farmers who at harvest-time gather as much as half a ton of cotton fibre in one working-day. These people are honored as heroes of labor. Within the last four years the average income, in money, of each collective farm household in Uzbekistan has increased tenfold.

Here is a *kishlak*—an Uzbek village. Flat-roofed houses are scattered among green gardens. All the children of the village attend a new and spacious school. Formerly the children of the rich were the only ones to go to school and they spent their time repeating the lines of the Koran to a mullah. Now the village not only has schools,

but a Red Tchaikhana—a tea-room with a library and theatre attached—a club in the old mosque, a small electric power station for the use of the people, and a cooperative store in place of the former shop of a speculator. Here there are neither *bey*s (rich land-owners) nor landless peasants; there is no rent and no poverty.

The railway, passing through gardens, heads toward Tashkent, capital of the Uzbek SSR ($41^{\circ} 19' N.$; $71^{\circ} 16' E.$). This city of 600,000 inhabitants is situated in the midst of a broad oasis irrigated by canals carrying water from the river Chirchik, the right tributary of the Syr Darya. Precipitation is low, amounting only to 13.7 inches during the year. The summer is practically rainless, cloudless, and very hot with an average July temperature of $81.3^{\circ} F.$ It is like the tropics, but far less oppressive because the nights are cool. The best time of the year is autumn. Winter is wet, with mild frosts that do not last long, and an average January temperature of $32.5^{\circ} F.$ In general the climate of this town is typical of the entire plain of Central Asia.

Tashkent is the most advanced town of this section, but even Tashkent has the same characteristics as the other Central Asiatic towns and has had the same history. It was divided into two towns, the old and the new, which were separated by a wide irrigation canal. The old native town had existed from time immemorial: an ant-heap of clay huts with no windows facing the street, flat roofs, a labyrinth of narrow streets as tortuous as the path of a worm in a tree-trunk; the sinister reticence of the Mussulman family; the lack of rights for women before men, and men before the authorities; nests of white storks on the minarets of the mosques; the confused and noisy activity of the oriental bazaar.

At the opposite pole in colonial relations was the new, European town spaciouly planned, with its rows of tall poplars, constantly rippling streams, trolley cars, comfortable homes of government officials and cotton-buyers.

The removal of colonial conditions and the realization of the equality of nationalities gave rise in Soviet Central Asia to the most interesting procedure in the planned reconstruction of towns and the abolition of the old two sections.

Tashkent has greatly changed its appearance. In the "new" town

the streets are asphalted, new buildings are erected, a water-supply system has been installed for the first time. But most important of all changes is the fact that many Uzbek doctors, engineers, professors, and industrial workers live in the new town now, as well as in the "old" town. The so-called "old" town is changing even more rapidly than the "new." Through the clay-and-earth buildings of the past straight and wide avenues are being constructed, schools and large dwelling-houses are being built, and new trolley lines laid. Now there is a woman's club here, a medical technical school, a printing works, and the Uzbek National Theatre. In the heart of the "old" town, which till quite recently was a stronghold of Islam, there stands a monument to Lenin.

In pre-revolutionary Central Asia there was no large-scale industry. The tsarist government obstructed the founding of industrial enterprises here because it guarded the factory owners of the central regions against competition and avoided the rise of a revolutionary working-class in the colonies. Cotton, the principal raw material of Central Asia, was not manufactured into finished articles. The cotton-refining mills simply freed the fibre of the cotton-seeds in order to lighten the weight of the raw material and thus facilitate its export. Bales of cotton in their journey to the central regions of Russia passed bales of fabrics on their way to Central Asia. People's labor was wasted, but the colonies covered the expenses. The Uzbek cotton-grower was underpaid. The Uzbek consumer of cotton fabrics had to pay too much.

In Central Asia today there is a large-scale industry, a cotton industry, in particular. Central Asia provides the mills of the central regions of Russia with raw cotton, but part of the cotton is worked up on the spot. During the years of Soviet power the industrial production of Uzbekistan has increased fivefold. Working-men's wages have increased by more than 100% within the last four years.

Tashkent is the largest industrial town in Central Asia. A great textile enterprise, combining the processes of spinning, weaving, and finishing, has been constructed here. This plant manufactures millions of yards of cotton fabrics each year, and at the present time its equipment is being doubled to a capacity of 211,000 spindles and nearly 7,000 looms.

Cotton is the main theme here. The development of cotton-cultivation has led to the construction in Tashkent of a huge factory for the manufacture of agricultural machinery. Improved plows, cultivators, harrows, and cotton-harvesters are constructed here. Near Tashkent an electro-chemical plant is nearing completion that will provide the cotton plantations with nitrogenous fertilizers; for the soils of Central Asia are deficient in nitrogen. This plant will be operated by the cheap power from the hydro-electric stations of the river Chirchik, which will have a capacity of 168,000 kilowatts. This construction is broad in conception, involving the production of electric power, and chemical products, and the irrigation of thousands of acres of land.

Not far from Tashkent, in the densely populated valley of Angren, Soviet geologists have discovered at Almalik vast deposits of copper. This has provided the basis for the construction of a first-rate copper plant during the Third Five Year Plan period.

Tashkent is the most important cultural center of Central Asia. Most of the thirty-three universities established in Uzbekistan since the Revolution are situated here. Irrigation engineers, agronomists, teachers, doctors, economists and other specialists are being trained. The scientific institutions of Tashkent are carrying on a vast amount of work in connection with the detailed study of the natural resources of Central Asia and are thus paving the way for new methods of utilizing them. Many books in the Uzbek and Russian languages are published. The newspapers of Uzbekistan have a circulation of one million. Every day ten or more airplanes leave the airport of Tashkent, all flying in different directions.

The highest administrative posts in the Uzbek SSR are occupied in the main by Uzbeks. But there is no exclusiveness here: the friendship and trust existing between the Soviet peoples account for the fact that among the highest officials there may be Russians, Jews, Armenians, and a half dozen other nationalities.

In pre-revolutionary Uzbekistan a woman had no more rights than an inanimate object. She was priced at so many pounds of rice, ate her husband's leavings, and was not permitted to go into the street with her face uncovered. Today the women of the Uzbek SSR, as throughout the whole of the Soviet Union, enjoy abso-

lutely equal rights with men. The ransom of brides, the giving in marriage of minors, and polygamy, are earlier customs which have been forbidden by law and have died out. Among the industrial workers of Uzbekistan one-third are women, many of whom are highly skilled experts at their trade. By the end of 1938, 3,649 Uzbek women were tractor operators, 182 were leaders of tractor brigades, 20 were repair mechanics. For the first time Uzbek women have become teachers, actresses, and doctors. Many women who have manifested striking examples of selfless work in the collective farms and the factories have been elected to the Supreme Soviet of the Republic, occupying the highest position in the government of the State.

From the oasis of Tashkent the railway runs in a southerly direction, deep into Uzbekistan. It crosses a region which is still known by its old name "Starvation Steppe." The greater part of this steppe used to be barren. The irrigated area has now greatly increased; the steppe is populated, and cotton and rubber-plants are cultivated in the new fields.

Farther on, the line branches off in two directions: one line leads east to the oasis of Fergana; the other west, to the oasis of Zeravshan. Besides the oasis of Tashkent, these are the two most important oases in the Uzbek SSR.

The valley of Fergana is surrounded by a ring of mountains with narrow gaps opening toward the west. The valley is traversed by the Syr-Darya, but the streams that flow down the mountain-sides are not allowed to reach it; instead they are utilized for irrigation and the valley of Fergana is thereby transformed—except in its central part—into one almost unbroken stretch of gardens, vineyards and cotton plantations. When one looks down upon the valley from the nearby mountains, its green floor surrounded by grey rocks resembles the bottom of a great goblet, and recalls scenes in parts of California. For density of population this region stands among the first in the USSR. The fields, saturated with the rays of the sun, protected from the wind, and covered with a network of waterways as dense as the capillaries of the human body, are extraordinarily fertile. Remarkably heavy yields of cotton are obtained in this region. As many as seven crops a year are obtained of alfalfa, a

nitrogen-absorbing fodder-plant which alternates with cotton in the crop-rotation system. Unirrigated, so-called *bogar* wheat-fields lie on the mountain-sides, where the rainfall is heavy. In addition to this amid the gardens and plowed lands, one can see oil derricks, pit-heads, cotton-refining mills, electric power stations, and locomotive sheds. In the town of Fergana there are new cotton mills, a new silk-spinning factory, and a new oil mill—one of the largest in the USSR. In Kouvassai there is a new cement works; in Shorsou new sulphur mines.

The valley of Fergana is the richest region of Central Asia. The greater part of it belongs to the Uzbek SSR, but part of it comes within the territory of the Tajik SSR and of the Kirghiz SSR. The national boundaries in the densely populated valley of Fergana are very tortuous, but relations between the Union Republics are such that though the train passes several times from one republic to another in the course of the journey through the valley, one may not be conscious of the fact. There are no formal lines of demarcation. We are in one single Soviet land; and yet within the limits laid down by the agreement of the Union, each Republic is a sovereign State.

The railway line which runs to the west takes us to the oasis of Zeravshan, a river which once was a tributary of the Amu-Darya but has not reached it now for many centuries. It gives its waters to the fields and dries up in the desert. The oasis of Zeravshan is still another fertile green zone of cotton, rice, alfalfa, fruit—and silk—lying amid bare plains and hills under a blazing sun in a cloudless deep blue sky.

The largest towns in this oasis, Bokhara and Samarkand, are the most ancient towns of Central Asia. A thousand years ago Bokhara was the capital of the whole land. Arabian writers spoke of it as "a haven of glory, a *Kaaba* of domination, a meeting place of the foremost people of the times." Samarkand flowered under Tamerlane. There are still to be seen here the majestic buildings of that epoch, unique memorials of Mussulman architecture celebrated all over the world, which are very carefully protected today. Rising above the gardens and the low houses are the ribbed cupola of the tomb of Tamerlane, the blue arch of the mosque erected in

honor of his wife, and the sloping minarets of the mosque of his grandson, a succession of high portals, fine ornamentation, and marvelously tinted tiles.

Far from the railway, on the lower Amu-Darya, which flows into the Sea of Aral, lies the Oasis of Khorezm, surrounded on all sides by a sandy desert. Cotton and the finest seed alfalfa are cultivated here. A fish canning industry has been established. The oasis is connected with the rest of the country by a regular air service. On the lower Amu-Darya are the Khorezm Region of the Uzbek SSR and the Kara-Kalpak Autonomous SSR (79,650 sq. mi.) which is part of the Uzbek SSR—inhabited by Kara-Kalpakians, Uzbeks and Kazakhs. On the banks of a new irrigation canal a new town is in process of construction, called Nukuss, the capital of the Kara-Kalpak Republic. The Government House and many dwellings have already been erected and a pedagogical institute is under construction.

Cattle breeding is being developed in the surrounding desert. Astrakhan sheep are bred here and the fleece of the lambs is highly valued in the markets of the world.

In Soviet Central Asia the oases are conquering the deserts very rapidly. Before the Revolution primitive methods of irrigation were used which had been handed down without change from the days of Zarathustra. During the years of Civil War even these became almost useless; the main structures were destroyed, the canals washed away, and the ditches stopped up with silt.

The year 1921 saw the beginning of the restoration and extension of the irrigation system: the reconstruction of the old systems and the construction of new ones. Today the irrigated area greatly exceeds that of pre-war times. Dams of reinforced concrete have been constructed, and broad, straight canals have been built which stretch for many miles and feed a highly ramified irrigation system. Powerful systems, such as the Dalverzin and Chardaryin systems on the Syr-Darya and the Kum-Kurgan system on the Surkhan-Darya, have already been constructed. On the lower Amu-Darya, for example, the new Dyz-Ket-Ken Canal, a magnificent example of hydraulic engineering, has just been completed. The depth of the canal is nearly twenty feet; the width at its upper end 180 feet.

It will irrigate 172,900 acres of land under cotton and alfalfa, and will also become a navigable water course. The ancient wooden water-raising wheels—the so-called *chigiri*—of which there are seventy thousand, are being replaced by water-towers. The reconstruction of the irrigation systems and the extensive propagation of the gambusia, a fish which feeds on the larvae of mosquitoes, is doing away with malaria. This work of irrigation is a complex whole. Not only are new irrigated plowlands created but also the water-supply of the inhabited districts is improved, hydro-electric stations are constructed, and so forth. The complexity of the work is simplified by the fact that all the branches of the national economy of the USSR are united by one plan. The absence of private ownership of the land makes it an easy matter to irrigate vast tracts of land at once.

Formerly water gave life to the peasants, but it was water which subjected them to the *bey*s, since the water was owned by the *bey*s, and not by the peasants. In the USSR water has ceased to be a means of exploitation. Within the very first years of Soviet rule a land and water reform was carried out which handed over the water to the State and the working peasants. And today in Soviet Central Asia the *bey*s and *kulaks* (rich exploiting peasants) no longer exist as a class.

Irrigation work in the USSR was first and foremost connected with the fight for the cotton independence of the country. Formerly half the cotton consumed in Russia was bought in the U.S.A., at a cost of a hundred million gold rubles a year. The fight of the Soviet State for cotton independence was crowned with success. Today the USSR is fully provided with its own cotton. The area under cotton in Uzbekistan has doubled, and the average yield has increased from 703 lbs. per acre in 1934 to 1460 lbs. per acre in 1938, as a result of the improvement of agricultural technical methods. Yields of 4400 to 8800 lbs. per acre are no longer exceptional. Indeed, some advanced collective farmers achieved a hitherto unparalleled figure in 1937; 12,460 lbs. per acre. At the present time the USSR gathers three and a half times as much cotton as was gathered in tsarist Russia.

But the organized battle with the desert in the USSR has only

Two generations of skilled
Tajik horsemen



Passenger plane crossing
the Pamir Mountains
in Tajikistan





A silkworm breeding collective
farm in Uzbekistan



Turkmenian weavers at work on a rug

just begun. Huge new irrigation systems have still to be constructed, for the irrigated area in the Soviet Union can still be increased several times.

THE TURKMENIAN SOVIET SOCIALIST REPUBLIC

To the west of the Uzbek SSR, between the river Amu-Darya and the Caspian Sea, lies the Turkmenian SSR, with a population of over one million people. In area (171,250 square miles) Turkmenia is slightly larger than the state of California.

The main natural features are the scarcity of water and the abundance of sun. Eighty-five per cent of its territory is occupied by the immense sandy desert of Kara-Kum—sun scorched yellow brown plain. There are low mountains only in the south—those of Parapamiz and Kopet-dag—along the borders of Afghanistan and Iran. Meager rivers flow down the mountain sides, forming rare oases at the edge of the desert. Here, in the oases along the Amu-Darya, live 90% of the population of the Republic.

Under tsarism Turkmenia, like the whole of Central Asia, was a poor and ignorant colony having no rights of any kind. Now industry has developed there, as in the other Central Asiatic Republics; and whereas formerly it could scarcely have been said to exist, it now produces two-thirds of the total output of the national economy of the Republic. Most of the inhabitants are engaged in cotton growing, which is largely mechanized. Within the last four years the number of agricultural machines has increased sevenfold; millions of rubles have been expended on the construction of irrigation systems; the mechanization of the process of clearing silt from the canals saved 480,000 working days in 1938 alone; the yield of cotton has doubled. Of immense importance in Turkmenia is cattle breeding which is also growing rapidly. From 1927-1937 the State budget of the Turkmenian Republic increased elevenfold. The ancient national culture of the people is being encouraged and the country is governed by the people themselves.

The railway from Tashkent passes the oasis of Zeravshan, crosses a long bridge over the rapid and turbid Amu-Darya and enters the land of the Turcomans.

The men are tall, and wear dark-red gowns and enormous black fur hats. Many a swarthy face is ornamented with a horse-shoe shaped black beard fringing the clean-shaven chin. The women's dresses are also dark red adorned with silver pendants and some of them wear high head-dresses under kerchiefs which hang over their shoulders.

By the river Amu-Darya stands the town of Charjow with newly erected silk-spinning and padding factories. The cultivated strip of land on the banks of the river is celebrated all over the Soviet Union for its sweet and fragrant Charjow melons.

Beyond Charjow the line plunges into the Kara-Kum desert. Here we see tufts of dusty, coarse, and prickly grass growing on the parched and cracked soil; here and there the nude and crooked saxaul, a tree which gives no shade; occasionally rippled dunes of shifting sand; the scorching sand smoking under the burning wind. The whirlwind is saturated with stifling dust. The sun is seen through a curtain of yellow haze. It presents the horror and the grandeur of the desert.

Till recently the symbol of the Kara-Kum desert was the mournful figure of the camel. Even now there are many camels in Turkmenia, but today they are representatives of a fading past. The symbol of the Soviet deserts is the motor-car on "supertires," broad tires which do not sink in the sand, the invention of Soviet engineers.

The railway cuts through the Kara-Kum desert. Rolling expanses of sand stretch on either side of the hedged-in track. In the depths of the desert is the railway-siding Repetek. Nearby is the famous Repetek scientific research station engaged in study and experiments for combating the desert. This problem is of extreme importance to Turkmenia, and not only to Turkmenia, but to the whole of Central Asia and Kazakhstan. In the USSR there are 1,150,000 square miles of desert. Shall they remain deserts—dead patches on the map of a regenerated country—a symbol of human impotence?

A part of the former desert and dry land has been irrigated, but desert tracts are immense. They cannot depend only on melting glaciers and mountain rains for water. Sooner or later there will

be a scarcity of river water. In addition, many of these regions are on a high level, and it is difficult to bring water to them. How, then, are the deserts to be utilized?

At first it would seem that there can be nothing more barren than a sandy desert. Life becomes extinct in vegetable tissues at a temperature of 129.2° F., while the sand is heated to a temperature of 174.2° F. Nevertheless, it is easier to cultivate and vitalize sandy deserts than any others, and of the deserts of the USSR it is this kind that predominates.

The sandy desert is not dead. The sand absorbs and filters the moisture of the winter and spring, but because of its low capillarity does not evaporate this moisture. There is always a stratum of fresh water under the sand, and a plant need only have long roots to be able to live in a sandy desert.

Where the sand has not been broken up by the hooves of nomads' herds, the desert is covered by a dry and sparse grass, on which camels and sheep graze. For these animals the desert is an excellent pasture-land. The sandy deserts are pre-eminently suitable for the raising of astrakhan sheep, a highly profitable breed.

Formerly, isolated groups of Turcomans and Kazakhs used to rove in the desert with their herds from well to well. They never laid in a stock of fodder for the winter and were always at the mercy of the desert. If the ground were crusted with ice in the winter, it frequently happened that though grass could be seen growing under the ice, the animals would die of hunger, unable to break the ice with their hooves and get at their food.

Collective and State farm cattle-breeding will be the method of utilizing those deserts which are not to be converted into agricultural regions by irrigation. Regulation of pasturage, the scientific choice and careful use of pastures, will prevent the herds' breaking up the sand and turning it into shifting dunes. The State-owned mechanical hay-making stations are introducing mowing and ensilage into the desert in order to provide the sheep with winter fodder. The nomads are beginning to lead a settled life. Cultural settlements are springing up in the heart of the desert. For example, Tamdi-Bulak, in the middle of the desert of Kizil-Kum, was formerly a tiny hamlet. Now it is a district center with a club, a sec-

ondary school, a public nursery, a telephone exchange, and a park of culture and rest.

In most of the regions where the sand has advanced on the plowlands, the sand has been stopped and made firm. It has been sown with sand-stabilizing grasses or saxaul, often with the aid of airplanes.

In former times bread was hardly ever eaten in the poor roadless desert. The nomads knew neither vegetables nor fruit. Today agriculture is a matter of necessity to the settled collective farms of the deserts.

Industry is making its first appearance in the desert and semi-desert regions, and these towns and industrial settlements must have gardens and orchards. Tens of thousands of workers live in the deserts; they must be provided with foods rich in vitamins. Soviet horticulture has come to their aid and has set for itself a task unheard-of in Russia of the old days—the raising of potatoes and corn, flowers and grapes, in the sandy desert. Scientific experiments were made on the crossing of plants, the chemical treatment of seeds, shading of crops, and mulching the soil with a thin layer of bitumen.

After much arduous labor, the scientific stations, the kitchen gardens of the industrial settlements, and the astrakhan sheep farms have proved that agriculture in the desert is feasible.

At the sand research station of Repetek, in the Kara-Kum desert, vines were planted in trenches 14 or 15 feet deep, the sides of the trenches being reinforced with a bituminous emulsion. The vines have attained a height of 5 feet. Certain varieties of watermelons grown in the Repetek station have yielded a crop of over 61,600 lbs. per acre. The Repetek railwaymen have been growing cucumbers, radishes, beetroot, lettuce, and melons in their kitchen-gardens in the sands by the usual method of watering the plants. It has been shown that mulberry-trees can be cultivated in the Kara-Kum desert.

In Chelkara, in the clay and sandy desert by the Sea of Aral, in Kazakhstan, where the rainfall is approximately 7 inches a year, a plot of land was watered with the moisture obtained from beneath the hilly sands. This orchard and kitchen-garden yielded a heavy

crop of carrots, cabbage, beetroot, cucumbers, tomatoes, radishes, red pepper, gooseberries, currants, barberries, melons, and water melons.

The vines, which were protected from the wind and covered with straw, survived a winter during which the temperature fell to 10 degrees below zero (Fahrenheit). The pears were frozen, but the apples survived. The cultivation of artificially-watered wheat, millet, sorghum, rice, and maize, was shown to be feasible, and innumerable flowers were grown, including twenty varieties of roses. These experiments in Chelkara gave rise to the organization of a scientific station for the cultivation of the desert, and their work has been highly successful.

New wells are being dug near the settlements in the desert, frequently supplying water which is distributed by means of wind-operated machinery to the gardens.

At the scientific station at Iolethan in the southeastern corner of the desert of Kara-Kum barley was raised on unwatered sand, the plots, which were fertilized with nitrogen and phosphorus, yielding nearly 440 lbs. per acre.

The struggle with the desert which has just begun is not an easy one, of course. But in its driest and hottest part the desert has already given bread to man.

The economic utilization of the desert has been facilitated by scientific investigation.

Before the Revolution the Kara-Kum desert was explored by isolated investigators only. Immense tracts remained unexplored, and there was no complete geographical map of the whole Kara-Kum.

Soviet expeditions have "re-discovered" the Kara-Kum desert, and it has proved to be not nearly so dead as many had supposed. In the heart of the desert Soviet explorers have discovered grasses, shrubs, and whole saxaul forests. Wells have been marked on the new map, erroneous preconceptions have been rectified, and many lacunae in the map have been filled in.

In 1933 there was an automobile run from Moscow to Kara-Kum back to Moscow which crossed the least explored northwestern section of the desert, adjoining the clay and stone plateau of Ust-Urt, whose edge was depicted in the maps by a hypothetical line.

The expedition defined this line more exactly and marked it in a new place on the map.

When the train has crossed the desert of Kara-Kum, it arrives at the oasis of the river Murgab, the first of a chain of oases lying on the rivers which flow down the southern border mountains of Turkmenia. All these rivers have one feature in common: they have no mouth. As soon as the river reaches the bottom of the mountain, it becomes shallow and, forming a sort of delta, disappears into the sand. Settlements stand and cotton grows on the territory irrigated by the waters of these rivers. These settlements are centers of new life. Instead of miserable felt tents there are now houses of simple architectural design, roads instead of tracks, columns of motor cars instead of caravans of camels, extensive collective-farm fields instead of tiny individual plots, tractors instead of oxen, schools instead of mosques, prosperity instead of misery, equality instead of servility, the red flag in the place of the crescent.

There have been settlements in these places since ancient times. Alongside the whole chain of oases, with their modern settlements, lie the sand-covered ruins of ancient large towns. Just a step from the lively, cheerful town of Bairam-Ali with its State cotton farm and cotton combinat which refines the cotton and manufactures oil and soap from the cotton seeds, is historic Merv, vivid reminder of the dead past. Rising above the dry yellow earth are the ruins of fortress walls, of high crenellated towers, of the cupolas of mosques. The beds of irrigation canals are grown over with reeds. Of the halls of the palaces nothing but weather-beaten bricks remain. Colored fragments of vessels are mingled with the sand. The corpse of a town extends over an area of thirty-eight square miles, all that is left of wealthy Merv, the capital of Khorassan, the mediator between Europe and China, where the son of Ghengis Khan massacred 1,300,000 inhabitants.

Here is Nissa, its ruins dating from the Parthian era (3rd century B.C.). Here is Anau, a dead town near which the American expedition of Pumpelly, in the course of its excavations of tumuli in 1904, discovered relics of the culture of the Bronze Age.

The railway crosses the whole of Turkmenia from east to west. A hundred and eighty-six miles to the south is Kushka (35° 17' N.),

the southernmost town in the USSR. The train passes around the foot of Kopet-Dag, and to the left can be seen the outlines of mountains which are wooded only in their ravines. To the right is the boundless sandy plain.

Ashkhabad ($37^{\circ} 54' N.$, $58^{\circ} 24' E.$), capital of the Turkmenian SSR, lies on the railway. It is a fairly large town with straight roads planted with trees, and with brooks flowing in concrete beds to prevent the water from sinking into the sand.

The industrialization of Turkmenia is evidenced in Ashkhabad, which formerly possessed no industry whatsoever. Here cotton and silk mills have been erected, a large manufactory of high-grade polished window-panes, a meat refrigerating plant, and a boot factory which includes a department for the manufacture of special native footwear for the different nationalities.

Ashkhabad is the center of the new Turkmenian culture. This culture may well be called new in view of the fact that before the Revolution not a single book had been published in the Turkmenian language, that in the whole of Turkmenia there were only nine doctors, and on the very eve of the Revolution there were only two Turcoman schoolgirls in the whole of the country. The number of schools in Soviet Turkmenia has increased by twenty-four. Today in Turkmenia there are four universities, five State theatres, and a cinema studio. In colonial Turkmenia, the land of arbitrary laws, stagnation, and fanaticism, the testimony of two women in a court of law was reckoned equivalent to that of one man. At the present time the People's Commissar for Justice in the Turkmenian Republic is a former peasant-woman.

Ashkhabad stands on the edge of the desert. Along roads leading from the town industrial goods and bread are carried to the inhabitants of the Kara-Kum desert and the produce of the desert—wool—is brought back to the town. A motor road runs from Ashkhabad into the heart of the desert, leading to a sulphur plant 155 miles away. This plant was constructed a few years ago on the sands, where sulphur deposits were discovered, and the USSR is now no longer obliged to import all its requirements in sulphur supply. Besides the motorcar which has become a common sight here, airplanes now fly between the sulphur works and Ashkhabad,

carrying drinking water to the works and sulphur to Ashkhabad. Formerly a caravan route—twenty days' tossing on the hump of a camel—connected Ashkhabad and the Khorezm oasis on the lower Amu-Darya via the Kara-Kum desert. Now this distance is covered by airplane in three hours.

From Ashkhabad the railway runs in a westerly direction. The oasis continues. The train passes one Turcoman village after another, where magnificent fast horses are bred and where the art of carpet-weaving, the occupation of the women, has achieved perfection.

The carpets of Turkmenia are celebrated all over the world. Their deep-red color is soft, their patterns delicate and beautiful. Formerly thirty thousand carpet-weavers worked individually but now most of them are united in large manufacturing cooperatives while some have entered small hand-weaving artels. Before the World War competition forced the Turcomans to replace vegetable dyes by chemical dyes. Now, dye-yielding plants are being gathered in Turkmenia on an extensive scale, in order to restore completely the wonderful ancient art of dyeing as soon as possible. A State Carpet Storehouse has been organized in Ashkhabad with an immensely rich collection of the smooth, bright-colored carpets from the oasis of Pendin, the rough carpets from the town of Kerki, the delicately designed carpets of Maru.

Sub-tropical agriculture has been started in the protected valley of the river Sumbar, to the south of the railway. Especially guaiula, a Mexican rubber plant, is sown here. Viterite, an extremely rare mineral, is extracted in the mountains of this region.

Once again the railway enters the desert. To the freight trains are attached platforms carrying enormous vats, which contain water to be distributed to the railway sidings scattered over the desert. In some places this water is supplied through underground conduits—*kyarizes*—as in Iran and North Africa.

The railway terminates at the coast of the Caspian Sea in Krasnovodsk. The masonry of the houses here is European, but their roofs are mainly flat, which indicates a dry climate.

Western Turkmenia has no water, so for a long time it remained barren and lifeless. It was only after the Revolution that its develop-

ment began, and its future prospects are fascinating. Matters have changed since planned economy set about the extensive exploitation of its exceptional mineral wealth, just newly prospected. The remarkable gulf of Kara-Bogaz-Gol lies to the north of Krasnovodsk. This is an enormous natural chemical laboratory, unique of its kind. The gulf, whose area is 6,950 square miles, is connected with the sea by a strait only 656 feet wide. The sea water rushes along the narrow strait into the gulf in a steady, swift flow. Under the hot sun a huge quantity of water evaporates in the shallow gulf; much more than in the deep open sea. As a result, a concentrated solution of various salts is formed. Of chief importance is mirabilite (dehydrated sodium sulphate), which is precipitated in the form of crystals in winter, when the water becomes cold. Storms throw it out on the shore, where it is piled up in huge white banks. These enormous and ever-growing deposits in the gulf of Kara-Bogaz-Gol render it possible to organize soda, sulphur, and other extremely important chemical industries on an unlimited scale.

Not long ago a chemical plant was constructed on the banks of the gulf, which formerly were entirely uninhabited. The extraction of the raw material is being mechanized and is growing. The new town of Kara-Bogaz-Gol has sprung up, and vineyards and kitchen-gardens have been laid out around the town in trenches in the shelly sands. The majority of the industrial workers of Kara-Bogaz-Gol are Turcomans, former cameleers who have become chemical workers.

To the south of Krasnovodsk lies the oil region of Nebit-dag, which was known even before the Revolution, but which has only now been investigated and put to use. Certain oil-springs have gushed as much as three hundred thousand tons of oil.

Oil is also extracted, as well as bromine and iodine, on Cheleken Island, not far from Krasnovodsk. Signs of oil, connected with the presence of sulphur, have been discovered in the desert of Kara-Kum.

West Turkmenia, that new region of chemistry and oil, lacked the raw material for the generation of mechanical energy, but coal has now been discovered to the northeast of Krasnovodsk.

However, West Turkmenia still suffers lack of water, which

hampers the development both of industry and of agriculture, but this also will be overcome. In the last few years underground streams have been traced at the northern foot of the Kopet-Dag mountain and this water can be utilized. The Uzboi, the ancient dried-up bed of the river Amu-Darya, extends from the heart of the desert of Kara-Kum to the Krasnovodsk region. A few centuries ago the Amu-Darya, after crossing the Kara-Kum, flowed into the Caspian; afterwards, changing its course, it began to discharge its waters into the Sea of Aral. The new mouth is 435 miles away from the old.

At the present time a huge plan is being studied as to how to turn the Amu-Darya into the bed of the Uzboi and divert its flow into the Caspian. This can be done by building dams at its lower end, and the river will then flow along the Kara-Kum desert, water and nourish it, and create vast new areas of irrigated agriculture. The silt of the Amu-Darya, which is more fertile than that of the Nile, will not fall to the bottom of the Sea of Aral, but will be deposited on new fields. The waterless Caspian coast will have a supply of fresh water, which at present is obtained by the distillation of sea-water or is transported in steamships from the opposite coast. The new torrent will generate hydro-energy, and new paths of development will be opened up to industry.

The deserts of West Turkmenia will be transformed into a flourishing land, just as in the U.S.A. the hands of man have changed large tracts of the deserts of Southern California into one great garden.

THE KIRGHIZ SOVIET SOCIALIST REPUBLIC

The Kirghiz Soviet Socialist Republic lies to the east of Central Asia. It slopes down to the Chu and Talass valleys (in the north) and to the Fergana valley (in the west) from the Tien-Shan chain, a high mountain range which extends mainly east and west and joins in the east with the glacier-covered height of Khan-Tengri (22,940 feet). In area Kirghizia (75,950 square miles) is five times as large as Switzerland.

The summits of the mountains are crowned with sparkling snow and bluish rivers of ice. Rich alpine meadows lie below the snow

line, and the northern slopes of the mountains are covered with an even growth of slender Tien-Shan fir trees.

A large part of the territory of the Republic is mountainous. Dense and succulent grass grows on the mountain pastures and the chief branch of Kirghizian agriculture—mountain pasture cattle-breeding—is carried on here. The finest pastures are situated in the high mountain valleys of Soussamir (in the north), and Alai (in the south), and in the syrts, the high mountain valleys of Central Tien-Shan (in the east).

The fertile fields in the foothills at the base of the mountain heights have been cultivated and artificially irrigated. The inhabitants here are engaged in farming. In the Chu valley they sow wheat, sugar-beet, southern hemp and *kenaf*; in the Talass valley tobacco; and cotton is sown in the Fergana valley. During the years of Soviet rule the area under crop has doubled.

In Kirghizia are located the main resources of power for the whole of Soviet Central Asia, and the largest coal deposits as well. Rivers, that are abundant sources of water-power, rush down the mountainsides.

The new industrial enterprises in Kirghizia are connected with the utilization of agricultural raw materials and the extraction of minerals. Cloth and sugar are manufactured in the Chu valley, coal and oil are mined in the Fergana valley, and lead is obtained in the mountains adjacent to the Chu valley. Mines are being sunk and are already on partial operation for the extraction of newly discovered rare elements (mainly in the Fergana valley). In Kirghizia radium, antimony, mercury, and indium have been discovered in industrially important quantities. During the years of Soviet rule industrial output here has increased more than a hundredfold.

More than one million people inhabit this Republic, most of them Kirghizians, a people of Turkic origin. The national costume consists of a quilted gown, soft boots with leather galoshes, and a white felt hat with black flaps. On fête days the women wear huge turbans of white linen wound round and round the head in many folds.

Customs were very savage in semi-feudal Kirghizia. Only a few

score years ago criminals were buried alive here, tied to the tails of unbroken horses, or branded on the forehead. The Kirghiz nation was dying out: between 1903 and 1913 its members had decreased by 10 per cent. The Revolution gave the Kirghizians equal rights, and ensured the development of their culture and economy. At present the birth-rate is far higher than the death-rate.

In pre-revolutionary Kirghizia 98% of the population was illiterate. The Kirghizians had no written language, but one has since been created, and today illiterate old people are met with only in the most remote villages. All the children are at school, and more than 4,800 students attend the universities and technical schools of Kirghizia.

The Kirghizians used to be nomads. Whole families of them would drive their cattle from pasture to pasture in the mountainous regions.

But in Soviet Kirghizia, as in the other former nomadic regions, the planned and voluntary settlement of nomads is in progress. This helps to sever patriarchal and tribal survivals of the past and to hasten the development of culture. The settlement of nomads is organized and financed by the State and special consideration is given to the planned settlement of collective farms in uncultivated districts.

When the nomads commence a settled life they continue their habitual occupation—cattle-breeding—but it is organized. The herds still move from place to place in order to utilize the summer high-mountain pastures, but now their movements are regulated by a planned itinerary, and they are followed, not by the whole population, but by brigades of herdsmen.

Formerly the cattle used to get their fodder in winter by digging under the snow with their hooves. Now the collective farms, with the aid of State machine-mowing and machine-tractor stations, lay in stocks of hay, and fodder roots for the winter.

Formerly the lasso and the dog were the only accessories of the cattle-breeder. Now cattle-sheds have been erected and wells dug in the new settlements, and a veterinary service has been organized for the first time. The people themselves formerly went to quacks when they were ill. These nomads were washed twice in their whole

lives, after birth and after death. Now baths and medical clinics have made their appearance in these agricultural settlements.

The stock of cattle is increasing from year to year. Cross-breeding by artificial fertilization is done on a large scale. Local sheep are crossed with merinos, the Kirghiz horses with the finest English breeds. Soon the whole composition of the herds will have been changed. In 1932, for example, half the sheep in the State farms of Kirghizia were coarse-wooled; now 86% of the sheep are hybrids, 11% are fine-wooled, and only 3% are coarse-wooled. A new breed of sheep was obtained in Kirghizia by means of hybridization: merinos have given it their fine fleece, and the local sheep their "kurdiuk," or large fatty excrescence at the tail. These sheep are well adapted to life in high altitudes.

From the southern section of the Turkestan-Siberian Railway (the Turksib), which crosses Kazakhstan, a branch line from the station of Lugovaya runs to the town of Frunze, the capital of the Kirghiz SSR. Frunze (42° 56' N., 74° 33' E.) lies in the Chu valley, between the range of Kirghiz Ala-tau and the river Chu.

Contours of snow-clad mountains are sharp against the blue background of the sky. The outlines of new government buildings stand out against the white background of the snow. In the center of the town is a square, bright with a profusion of flowers. Tall vertical poplars line the avenues. In the suburbs stand the newly created industries: a meat combinat, cloth, clothing, and tobacco factories, and a tannery. The town is growing rapidly; during the years of Soviet rule the number of inhabitants has grown from 14,000 to 100,000.

A motor-road runs from Frunze along the wide Chu valley into the heart of Kirghizia. Ten years ago cars had to cross irrigation ditches and raised clouds of dust which hid the horizon from view. Now there is a splendid clean motor-road here.

A new modern irrigation system and the great Chumysh dam have been constructed in the Chu valley. An enterprise of importance for the whole Soviet Union has also been created—a combinat for utilizing bast crops which had never been cultivated here before: *kenaf* and southern hemp, whose fibre takes the place of jute and is used for the manufacture of sacks and rope. Sugar-beet likewise

was never sown here before; now 32,110 acres of this crop are sown, and its cultivation has been mechanized. Kirghizia occupies first place in the USSR for its yield of sugar-beet, and the sugar-beet plantations are the sources of raw material for two new sugar refineries. There is no lack of wheat either in the Chu valley: Kirghizia helps to supply the other Central Asiatic Republics with bread.

Were it not for the surrounding mountains, the valley would bear a very strong resemblance to the Ukraine: poplars, white clay-walled huts, sunflowers, a warm climate, and the Ukrainian language. Many Ukrainians, who came to the valley before the Revolution, live here. There are also Dungan settlements, founded by a people (the Dungs) who came from Western China in the 19th century and have retained many Chinese traits.

The mountains have drawn together here. The Chu cuts through the high ridge in the narrow and deep Buam gorge. In the gorge of Aktiuz, which is not far away, lead mines are being worked and a hydro-electric station is under construction.

Higher and higher the motor-road climbs up the mountain-side until it leaves the gorge on the approach to Lake Issyk-Kul. The Great Kirghiz Highway, 496 miles long, leads through the mountain range to South Kirghizia, to the Fergana valley, in which are cotton plantations, coal-mines (in Souliukta, Kizil-Ki, and Kok-Yangak), a silk-spinning factory (in Osh), and an oil industry (in Changhirtash).

The Lake of Issyk-Kul is like a sea; one cannot see its opposite shore. In the north rises the Kunsey-Alatau, in the south the Terskey-Alatau, two snow-clad mountain chains, their white summits reflected in the blue waters of the lake. The lake, which is 5,180 feet above sea level, has an area of 2,395 square miles. Health resorts with hot springs are located in its vicinity, and steamers ply across it. The lake does not freeze in winter; therefore its name, "Issyk-Kul," which in the Kirghiz language means "warm lake." At the east end the mountains recede somewhat from the lake, and here is the town of Karakol lying in a fertile plain. The fields are golden with the wheat and scarlet with crops of medicinal poppy. There are also many apple orchards.

During the Third Five Year Plan a railroad will be laid extending from Lake Issyk-Kul to the town of Frunze.

Formerly, miserable mud-huts of the Kirghiz winter settlements used to be scattered about the fields. Now there are permanent collective-farm buildings here, comfortable houses, and well-warmed cattle-sheds.

One can reach the summer pastures in the mountains only on horseback by way of stony tracks. Below the line of eternal snows, and above that of the dense fir forests, lie the alpine meadows. The herdsmen live in round tents, built of a wooden framework covered with felt. A bonfire of dry dung burns in the middle of the tent, and skins containing horse's milk hang on the walls.

Beyond the river Sara-Jass, which belongs to the basin of the Tarim, the mightiest mountain peaks, snow-clad from their very base, range right along the frontier of China as far as the eye can see. Above the land of ice towers a diamond cupola—Khan-Tengri, the highest summit of the Tien-Shan range, $4\frac{1}{3}$ miles above sea level.

THE TAJIK SOVIET SOCIALIST REPUBLIC

To the southeast of Central Asia lies the Tajik Soviet Socialist Republic, otherwise known as Tajikistan, the land of the Tajiks. The area of the Republic is 55,545 square miles, and the population is over one million.

The principal nationalities of Central Asia are of Turkic origin, whereas the Tajiks are of Iranian origin. The Uzbek, Turcoman, and Kirghiz languages resemble one another, while the Tajik language differs very radically from them. Nevertheless, their generations of life together have obliterated many differences between these peoples. In their way of living and their general appearance, the Tajiks are close to Uzbeks.

The Tajiks are a people of ancient agricultural culture. The incursions of nomads gradually drove them from the plains to the mountains, and to the mountains the Tajiks brought their predilection for agriculture. Even in the most remote and barren ravines they sowed barley around their stone huts, sometimes in soil brought there in baskets.

Tajikistan commences in the west in semi-desert regions. Towards the east it rises more and more until it passes into the Pamirs at an immense height. Below lie the valleys of the Amu-Darya and its tributaries in the south, and the valleys of the Syr-Darya in the north. Where their arid land has been watered by means of irrigation canals, there are oases with flowering gardens, and green cotton and rice plantations. This part of Tajikistan is the most densely populated.

A little higher, on the mountain-sides, is a more temperate zone. There are forests here; grain is grown in these places without the aid of artificial irrigation, and cattle are raised.

Still higher, near the snow-line, are the pastures. The herds feed here in summer, and in winter descend to the warmer valleys.

Right on the summit lie the eternal snows. They form huge glaciers which are the sources of turbulent rivers. This is a real polar region with ice and perpetual cold, but there is no polar night. The Pamir heights act as a sharply-defined climatic borderline; the moisture brought into Central Asia by the west winds is precipitated here.

The valleys of western Tajikistan are flooded with sunlight and protected from the cold winds; the summer is sultry and the winter comparatively warm. But without man these valleys would have remained barren, for on both sides of the beds of the swift rivers the land was dry, bare, and hot. Only at the water's edge was there vegetation; impenetrable jungles of enormous reeds which are refuges for boars and pheasants.

Centuries of human labor were expended on the cutting of irrigation canals in these valleys in order to water the earth, and as a result it produced cotton, fruit, and rice. But the ditches which had been dug with mattocks were shallow and the irrigated area was small. The rivers blocked up the canals with silt which had to be cleared away by exhausting manual labor under the burning rays of the sun. The waters, the land, and the power were in the hands of the *Emir* and the *beys*. These rulers enmeshed the peasants in a net of taxes and rent which bound them hand and foot and gave them an insignificant portion of the harvest. Tajikistan, which

formed part of the emirate of Bokhara before it was sovietized, was the most backward region of Central Asia, a land of paupers.

The Revolution emancipated the Tajiks. The Emir fled to Afghanistan, and the Tajiks formed a Soviet Republic, which at first entered into the Uzbek SSR and then, after 1929, affiliated directly with the USSR.

The water became the property of the people. With the aid of engineering skill, up-to-date irrigation canals extending the sowing area have been cut in the valleys. Egyptian cotton has been introduced for the first time in the USSR. A new method of agricultural technique is being applied in the fields on a large scale. This is the "coining" of the cotton-plant: at a definite stage of development, the top of the central stem is split, which results in an increase of the yield, an improvement in the quality of the fibre, and a shortening of the total length of time required to reach maturity. In place of the barren deserts, there are now new collective-farm settlements. Over three thousand tractors are in use in the Republic. Poverty has been abolished.

Before the Revolution there were only two hundred industrial workers on the territory of Tajikistan. Today new large enterprises in the towns of Stalinabad, Leninabad, Kurgan-Tiubeh, and others, are working up agricultural raw materials: silk, cotton, and fruits. Deposits of minerals, coal, oil and polymetals, are being mined mainly in the region of the Fergana valley.

Tarred motor roads marked with international road signs run from valley to valley passing over the mountain heights between. New towns have been built, including the capital of the Republic, Stalinabad.

During the emirate only 0.5 per cent of the population were able to read. Even ten years ago in the villages of Tajikistan there were only 168 literate women. It is difficult to compare the Republic of today with Tajikistan of yesterday in point of culture. As everywhere in the Soviet Union, compulsory education has been introduced here. Before the Revolution there were 369 students; now there are 257,240. Translations of Pushkin, Tolstoy, Flaubert, and Victor Hugo have appeared in the Tajik language. Traveling collective farm theatres have come into existence which move from

village to village in motorcars giving performances. A local branch of the Academy of Sciences of the USSR has been created in Tajikistan, and local scientific and educational establishments have also sprung up.

The railway line which runs towards Western Tajikistan branches off from the main Central-Asiatic line near Bokhara and goes in a southeasterly direction. It passes Termez, the hottest town in the USSR (average temperature in July 89.6° F.), and, skirting the mountains, enters the Ghissar valley, which lies along the Kafirnigan, the right tributary of the Amu-Darya.

All around are the weather-beaten mountains with crumbling rocky sides. Thickets of pistachio trees and walnuts grow on the slopes. Flocks of Ghissar sheep graze on the pastures. Below, among the irrigated cotton fields, lie the *kishlaks* (villages), above whose flat-roofed houses tower the poplars with pinnacle tops. The railway, which was laid after the Revolution, leads to Stalinabad, the capital of the Tajik Republic.

This was the former site of the clay village of Dushambeh. Now the "town of Stalin" stands in its place. Large houses of modern architectural design border the wide streets. Trees have been planted along the pavements, but they are still young and do not yet give much protection from the scorching sun. One can hear the Tajik, Iranian, Uzbek, and Russian tongues spoken here. A few years ago there were neither schools, nor theatres, nor a water-supply, nor pavements. Now a printing combinat, a clothing factory, and a silk factory have been built; a textile combinat is under construction; and a hydro-electric station has been erected near the town on the river Varzob. A local branch of the Academy of Sciences of the USSR has been established in Stalinabad.

Except for tracks made by the beasts of burden there were no roads here whatever. At the present time motor-roads are being constructed here, connecting Stalinabad with Leninabad, Garm, Kurgan-Tiubeh, and other places. While all these districts are as yet not covered with a complete network of motor roads, Stalinabad is connected with different localities by airplane. The planes soar above the mountains, maneuvering through the narrow passes, almost grazing the stone walls with their wings. Peasants, agri-

culturists, frontier guards, all make use of these regular air lines, which are served by planes of the most up-to-date construction. The first wheel ever seen in the gorges of the Western Pamirs was the wheel of an airplane. The first carts were brought here by trimotor airplanes.

While peasants gathering pistachios are frequently menaced by tigers on the mountainsides, yet for density of air lines Tajikistan occupies one of the first places in the USSR.

Alongside the Ghissar valley lies the valley of Vakhsh, the greater part of which was formerly perfectly barren. Either cracked land or wild jungles three times the height of a man lay on the banks of the river. The construction of a great irrigation system with the aid of modern excavators has been commenced. One hundred and twenty-five million rubles have been expended on this work. The river has been made to run in an artificial bed, partly cut out of the sheer rock. The Vakhsh—perhaps the melted ice of undiscovered Pamir glaciers—runs along a bed of reinforced concrete, passes through windows with iron sectional sluice-gates, and is distributed over a close network of small canals. The Vakhsh valley represents a quarter of the artificially irrigated agriculture of Tajikistan. The irrigated areas are sown with the finest long-fibred Egyptian cotton, which in the best collective farms yields 2,200 lbs. and over per acre. Thousands of collective farm families who have come from other districts live in the new villages which have sprung up in place of the former deserts. Not a few mountain dwellers have descended from the deep gorges of the Pamirs to live in the valley plains from which their ancestors were ousted many centuries ago.

The town of Kurgan-Tiubeh, the chief town of the Vakhsh valley, has increased in size. The largest cotton-refining factory in Central Asia has been constructed here, as well as a milling plant. A magnificent motor road connects this town with Stalinabad, and a narrow gauge railway connects with the various districts in the valley.

To the north of the Tajik SSR belongs a part of the Fergana valley, a fertile region of cotton, silk, and fruit. Here also are situated the most important industrial enterprises of Tajikistan—all of

which were developed after the Revolution. In Kanibadam fruit is canned; in Kim and Nefteabad oil is obtained; in Shurab coal is mined. Vast deposits of polymetals (lead, zinc, silver, arsenic, rare elements) have been explored in Kara-Mazar and are now being studied, and the exploitation of well-equipped mines has begun. During the epoch of Arab rule Kara-Mazar was the world center of silver and lead mining. Centuries passed before life returned to this region.

The chief town of North Tajikistan, Leninabad, formerly called Khojent, lies on the Syr-Darya at the point where it leaves the valley of Fergana. Former Khojent was characterized by the names of its districts: "the district of the people who know not the taste of bread," "the district of the people who eat cow-dung," "the district of eternal debtors." Leninabad is known for its new and technically perfect silk combinat which includes cocoon-spinning and weaving shops, and employs three thousand workers of both sexes. A pedagogical and an agricultural institute have been created in the town and there are twenty-two public libraries.

Until quite recently there was no direct connection between North and South Tajikistan, between the Fergana valley and the capital of the Republic. They were separated by three high impassable mountain ranges, the Turkestan, Zeravshan, and Ghissar chains. Now these are an obstacle no longer for a direct motor-road connects Leninabad and Stalinabad.

The Pamirs rise in the east of Tajikistan. They are called "the roof of the world" and form a high mountain junction, the meeting-point of the mightiest mountain ranges of Asia: Hindukush in the south, Karakorum, which is connected with the Himalayas, in the southeast, Kunlun in the east, and Tien-Shan in the north. Here is also the meeting place of the frontiers of the USSR, Afghanistan, China and India.

The Western Pamirs are intersected by narrow, deep gorges. Rapid torrents flow at the bottom of these gorges, and are crossed here and there by shaky log bridges held down by stones. High up amid the rocks, stone huts, barley plantations, and rare mulberry and *uriuk* (apricot) trees, cling to the mountainsides. Sometimes there are not even paths in these overhanging rocks. Instead there

are *ovrings*, narrow shelves made of stakes stuck into the rocky wall and covered with dry twigs and turf.

The mountain Tajiks who live in the gorges of the Western Pamirs are the most ancient peoples of Central Asia. They were at the same time the poorest, their usual food consisting of flat cakes made of ground mulberries. The Pamir Tajiks belonged to the sect of Ishmaelites who starved all their lives, because every particle of gold they obtained by their arduous labor they gave, ounce by ounce, to the leader of the sect, Aga-Khan, the man-god, who lived at Bombay.

The Eastern Pamirs is a highland district whose base lies at an extraordinarily high level. In contrast to the Western Pamirs, there are no deep gorges here, but flat and cup-like valleys strewn with small pebbles patched here and there with dusty tufts of *teressken* grass. The bottom of the Pamir valleys lies at a height of 13,124 feet above sea level.

A stream flows sluggishly through the silent barren valley. The ground is strewn with what looks like fossilized snakes, but are in reality the twisted antlers of wild mountain sheep—*arkhars*. The air is so rarified, water boils at 181° F., and rice cannot be cooked. In the daytime it is extremely hot and the sunrays possess a maximum of ray-energy. The nights are frosty; and the stream becomes covered with ice. In the rocks are holes drilled by the wind. The stones are scorched, covered with the brown crust of "desert sunburn."

Nomad Kirghizians roam about the valleys of the Eastern Pamirs, where their sheep and yaks find fodder on the mountainsides. The cattle graze on the pastures even in winter; the clouds cannot easily make their way here and there is no snow, although at the foot of the Pamirs, in the Alai valley, the snow reaches the tops of the telegraph poles.

Today the Pamirs form an autonomous region, Gorni-Badakhshan (25,800 square miles), which is part of the Tajik SSR. The inhabitants of this section no longer pay tribute to Aga-Khan. The people of the Soviet Pamirs work in collective farms which provide a living for them. Goods to the value of nearly fifteen million rubles were brought to the Pamir heights in 1938. The area under

crop has been extended and cultivated with the help of the State, and during 1938 the area was tripled. In Shugnan the best collective farmers obtain a yield of 2 tons of potatoes per acre. New methods of agricultural technique further the progress of land cultivation, and in the Eastern Pamirs agriculture has been introduced for the first time. The first crops were sown in 1933, and scientific expeditions have discovered thousands of acres of cultivable land. On the "Roof of the World" turnips, cabbage, and several varieties of North American potatoes are raised. The experience of agriculture in the Pamirs has provided a starting-point for agriculture in other mountainous regions of the USSR, including the Altai mountains. The "Pamir" State cattle-breeding farm has been organized at a height of 12,900 feet. Schools, hospitals, and cinemas have been built. Hitherto the only fuel in the Pamirs was teressken grass, but not long ago the mining of coal was commenced here near Murgab.

A track made by beasts of burden led through the Pamir highlands, in the clear stillness of the desert. Every caravan left a dead camel in its wake, and the white skeletons of the animals, picked bare by jackals, lay among the stones as symbolic landmarks along a difficult winding path. Today a motor-road 468 miles long runs right across the Pamirs—from Osh (in the Fergana valley) to Khorog (the capital of the Gorni-Badakhshan Region, which lies in a gorge at the Afghan frontier). Stone boulders have been dynamited and cleared away. A passenger bus runs through the Alai valley, a feather-grass steppe at an altitude of 9850 feet, climbs to the "Roof of the World" by a zigzag route, crosses the bare, grey-yellow Pamir valleys, passes round the bluish-green Lake of Kara-Kul, over mountain ridges through saddles which are higher than Mont Blanc, and through half-tunnels where shaky balconies, made of rotten logs and fixed to the sheer wall, once hung over the canyon precipices.

Khorog is a new town with a pedagogical technical school, a secondary school, and a printing plant. A hydro-electric station is under construction near the town which will be the first in the Pamirs. Khorog is at an altitude of 6,890 feet above sea level, but at the same time it lies in a well surrounded, on all four sides, by a wall of mighty mountains. Every day, at a certain hour, the

airplanes of the regular passenger and mail services glide through the rocks and land at the bottom of this deep well.

In the very heart of the Pamirs, where their flat eastern valleys lying above the clouds meet the deep and narrow western ravines, there is a region several thousand square miles in area which, up to a few years ago, was quite unexplored: the pinnacle of the mountain heights of the Pamirs, one of the largest and most remarkable glaciated tracts in the world. This land of ice remained unexplored, although its exploration would have been of great practical importance, for here are the sources of the rivers which give their waters to the irrigation systems of the Central-Asiatic Republics.

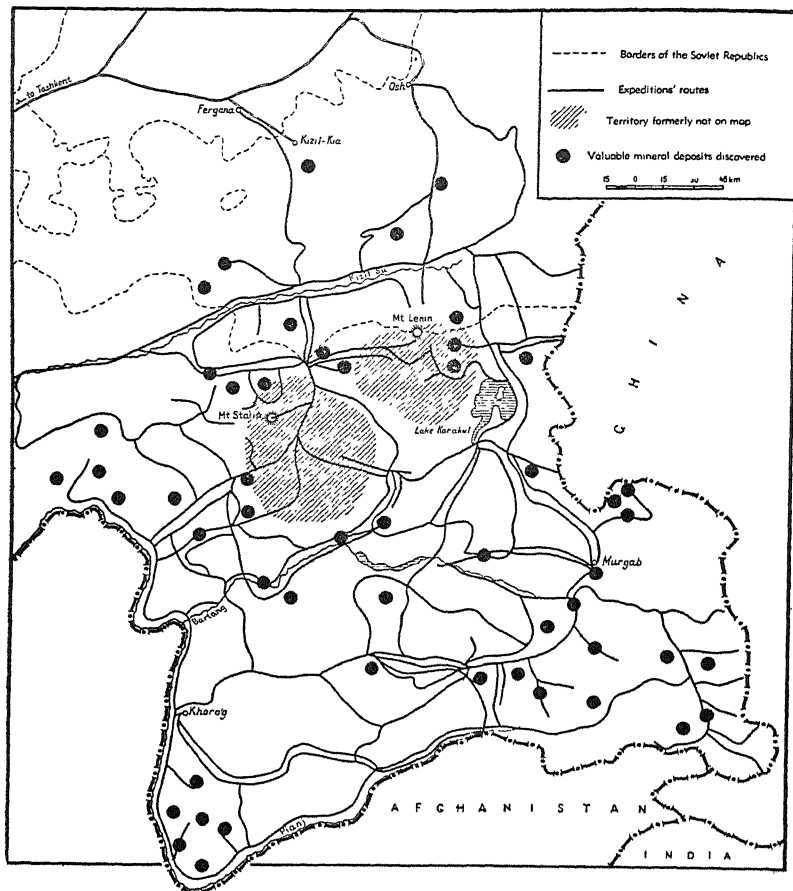
Ten years ago the planned survey of the unexplored Pamir regions began, accompanied by a thorough exploration of the whole mountainous region of Tajikistan. Hundreds of scientists participated in this work; geographers, geologists, meteorologists, ethnographers, archaeologists, economists, and so on, making use of the most up-to-date equipment and of airplanes.

The arduous work of several years led to remarkable results which threw new light on this vast country on the borders of India, for which until yesterday there was not even a complete geographical map.

Here tin, optical fluor, a number of rare elements, and new gold strata were found. (See Map 23, page 324.)

In the ruins of an ancient castle on the Zeravshan, highly valuable manuscripts were discovered relating to Sogdian culture, which flourished over two thousand five hundred years ago. These finds made it possible to restore the language completely and to throw light on the social life of ancient Sogdiana.

The intricate knot of mighty mountain ridges has been completely unravelled and marked on the map. The legendary glacial passes of Tanymass and Kashal-ayak have been discovered; once it was said they were the means of escape for the Tajiks of the plains from the incursions of the nomads. The gigantic glacier Fedchenko, one of the largest non-Arctic glaciers in the world, nearly 49.6 miles in length, has been discovered and explored. A



MAP 23—ROUTES OF THE CHIEF SCIENTIFIC EXPEDITIONS TO THE PAMIRS
FROM 1932 TO 1936

hydro-meteorological observatory having a permanent staff of scientific workers has been erected near the Fedchenko glacier at a height of 14,100 feet above sea level, in the center of a formerly unexplored region. The building is specially designed and constructed for a region where the temperature falls to 76 degrees below zero, with observation rooms, a wireless room, meteorological

and photographic laboratories, and an electric generating plant, in addition to the living quarters.

The highest mountain in the Soviet Union stands in the center of this glaciated node of mighty mountain chains. It has been climbed and its height established as 24,590 feet above sea level. This majestic peak bears the name of Stalin.

UNION OF SOVIET SOCIALIST REPUBLICS (USSR)

Area	21,175,200 Square Kilometers (8,176,000 Square Miles)
Population (as of January 17, 1939)	170,467,186
Number of different peoples	175
Number of Union Republics	11 :—

Russian Soviet Federated Socialist Republic

Area	16,510,500 Square Kilometers (6,375,000 Square Miles)
Population	109,278,614

Ukrainian Soviet Socialist Republic

Area	445,300 Square Kilometers (171,950 Square Miles)
Population	30,960,221

Byelorussian Soviet Socialist Republic

Area	126,800 Square Kilometers (48,960 Square Miles)
Population	5,567,976

Azerbaijan Soviet Socialist Republic

Area	86,000 Square Kilometers (33,200 Square Miles)
Population	3,209,727

Georgian Soviet Socialist Republic

Area	69,600 Square Kilometers (26,875 Square Miles)
Population	3,542,289

Armenian Soviet Socialist Republic

Area	30,000 Square Kilometers (11,580 Square Miles)
Population	1,281,599

Kazakh Soviet Socialist Republic

Area	2,744,500 Square Kilometers (1,059,700 Square Miles)
Population	6,145,937

Uzbek Soviet Socialist Republic

Area	378,300 Square Kilometers (146,000 Square Miles)
Population	6,282,446

Turkmenian Soviet Socialist Republic

Area	443,600 Square Kilometers (171,250 Square Miles)
Population	1,253,985

Kirghiz Soviet Socialist Republic

Area	196,700 Square Kilometers (75,950 Square Miles)
Population	1,459,301

Tajik Soviet Socialist Republic

Area	143,900 Square Kilometers (55,545 Square Miles)
Population	1,485,091

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